BY ORDER OF THE COMMANDER
HQ Air Force Flight Test Center (AFMC)
Edwards Air Force Base CA 93524

AFFTC INSTRUCTION 91-5

12 March 2002

Safety

AFFTC TEST SAFETY REVIEW PROCESS

COMPLIANCE WITH THIS INSTRUCTION IS MANDATORY

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This instruction implements AFMC Sup 1 to AFI 91-202 (in particular Chapter 13), and AFMCPD 99-1, paragraph 1.3.2, *Safety Review Process*, for the Air Force Flight Test Center (AFFTC). It directs the application of system safety principles to the planning and conduct of all AFFTC and other designated AFMC test programs (reference paragraph 9.3) regardless of the agency conducting the tests. It also provides guidance for the application of system safety principles to AFFTC training programs, logistics testing, and publications.

SUMMARY OF REVISIONS

Many changes to this instruction were incorporated to clarify existing guidance by modifying the organization or text. Lessons learned in the form of routinely accomplished techniques and routinely approved deviations were also incorporated. Guidance concerning deviations from technical manuals was added to document AFMC/DOV policy (paragraph 1.4.2). The Test Safety Process Review Board was eliminated in favor of requiring AFFTC/SET to continuously solicit recommendations for improvements from all Test Safety Process members and update this instruction as warranted (paragraph 2.3.13). AFFTC/PK responsibilities specific to this instruction were removed and relevant responsibilities transferred to the project managers (paragraph 2.6.1). The recommended Statement of Capability wording was clarified (Figure 2-1). A requirement was added for AFFTC/SET to inspect each Primary Unit Test Safety Officer (UTSO) continuity book on an annual basis and report to the unit commander (paragraph 2.3.12). Requirements for unit tracking of safety packages were clarified (paragraph 2.5.6.1). The UTSO book contents were changed (Figure 2-2). Test teams will be required to inform AFFTC/SET of Category I Deficiency Reports and test-related in-flight emergencies (paragraph 2.6.5). Many duties specifically given to the project manager but historically performed by various members of the test team were assigned to the test team in general. Procedures for conducting safety planning for tests in which the AFFTC is not the responsible test organization were clarified (paragraph 9.1). "Flight surgeon" and "aerospace physiologist" were added to the notional lists of additional reviewers (paragraphs 4.2.1 and 4.3.2.2). The task of scheduling approval briefings was given to the test team (paragraph 5.4.4). Documentation of coordination comments and their resolution was changed to reflect historical norms (paragraph 5.3). Risk assessment for amendments was clarified (paragraph 7.1.4). The term "unusual event" was defined and the necessary procedures clarified (paragraph 6.3). The amendment descriptions and attachments were reorganized for consistency and clarity. Based on the very poor historical compliance with "closeout" amendments, an additional amendment (the "continuation amendment") was created to ensure lessons learned are captured and safety planning is assessed on an annual basis (paragraph 7.7.1). (For testing under a safety package to continue, a continuation amendment will be required prior to each yearly anniversary of the initial package approval date.) Safety review of Test Pilot School activities and combined technical and safety review boards for student test plans were clarified (paragraph 9.1). Guidance for the safety review of locally created publications or supplements was added (paragraph 9.5). The AFFTC Forms 5028 and 5028A were cosmetically changed to simplify digital creation and, for 5028 amendments, clearly identify the type of amendment. Elevated risk test elements were modified to include lessons learned from unmanned vehicle and weapons testing (paragraphs A8.3.10 and A8.3.12). Lastly, the AFFTC Risk Assessment Method attachment was changed to accurately describe the risk assessment process and its intended results (Attachment 8).

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Chapter 1

INTRODUCTION

1.1. Background.

1.1.1. The objective of this process is to reduce the risk of mishaps during test activities by identifying test unique hazards and establishing minimizing procedures/corrective actions to eliminate or control the hazards. Independent reviewers assess the risk mitigation proposed by the test organization and assess the overall risk of the test program, which is then approved at a level determined by this risk assessment.

1.1.2. It is impractical to embark upon a program dedicated to "minimum" risk in all situations. The final objective of this process is to determine an acceptable level of "measured" safety risk warranted to support the test program within other programmatic constraints such as cost and schedule, and then to inform management of this residual risk level. It is never expected that all test programs go without surprises, but the goal of this process is to ensure approved programs are structured with a robust test process that can safely accommodate unknowns.

1.2. Scope. This instruction applies to:

1.2.1. All ground and flight test activities involving AFFTC assets (personnel, aircraft, ranges, equipment, facilities, airspace, or the general public when the AFFTC/CC has responsibility for their safety as the Major Range and Test Facility Base Commander).

1.2.2. AFFTC-developed flight training programs, including TPS curriculum activities.

1.2.3. Any airshow or aerial demonstration conducted using AFFTC aircrew or assets.

1.2.4. At the discretion of the Unit Commander or the AFFTC Chief of Test System Safety, any activity that presents unique hazards not covered by routine procedures or management directives. The procedures defined in this instruction may be used to complete and approve an Operational Risk Management (ORM) review.

1.3. Waivers. The AFFTC Commander may waive the requirements of this instruction during times of national emergency. During exercises simulating a national emergency this waiver process may be practiced; however, actual flight tests conducted will not be above low risk. The AFFTC Chief of Test System Safety may approve variations from this instruction provided that the intent of the system safety process and this instruction are adequately met.

1.4. Authority. Compliance with the safety review process does not provide authority to violate Air Force, AFMC, or AFFTC instructions or directives. It does provide authority to deviate from technical manual (including flight manual) guidance.

1.4.1. When a test activity must deviate from a directive, units will comply with the applicable waivers/deviations process documented in the applicable directive. A copy of the waiver will be filed in Tab 4, Supporting Documentation of the AFFTC Form 5028 Safety Package. If the waiver authority is within the AFFTC chain of command, the waiver may be obtained during the coordination cycle and documented in the coordination comments section of the AFFTC Form 5028.

1.4.2. When a test activity must deviate from a technical manual, units will note the deviation in the safety package and incorporate safety planning as required to address the deviation.

1.5. Applicable Instructions/Publications.

1.5.1. DODD 3200.11, *Major Range and Test Facilities Base*

1.5.2. Mil-Std-882D, *System Safety Program Requirements*

1.5.3. AFI 91-204, *Safety Investigations and Reports*

1.5.4. AFPAM 90-902, *Operational Risk Management (ORM) Guidelines and Tools*

1.5.5. *Air Force System Safety Handbook* (AFSA, Kirtland AFB, NM)

1.5.6. AFMCPAM 91-1, *Flight Safety and Technical Considerations Guide for Flight Testing*

1.5.7. AFMCPD 99-1, *Test and Evaluation Risk Management*

1.5.8. AFI 91-202, *U.S. Air Force Mishap Prevention Program* (Inc AFMC Sup 1)

1.5.9. AFFTCI 99-1, *Test Plans*

Chapter 2

RESPONSIBILITIES

2.1. General. This chapter establishes the responsibilities of organizations and individuals involved in the AFFTC Safety Review Process.

2.2. Statement of Capability (SOC) Approval Authority.

2.2.1. Ensure that all SOCs inform potential customers of the requirements and provisions of this instruction.

2.2.2. Ensure that AFFTC/SET is invited to all test concept meetings.

2.2.3. Ensure that each SOC issued by the AFFTC covering activity within the scope of this instruction includes either the following statement or other wording provided in the Capabilities and Resources Estimate submitted by the AFFTC Test System Safety Office (AFFTC/SET):

> AFFTC Safety Review: The proposed test/activity must be independently reviewed for adequate hazard identification and mitigation. Residual risk to AFFTC personnel and assets must be assessed and approved by responsible AFFTC authority. The procedures used for test safety review at the AFFTC are defined in AFFTCI 91-5. The AFFTC Project Manager, with customer support, is responsible for ensuring this review is accomplished on time to support the test schedule. The following is a list of items to take into consideration for planning purposes:
>
> Final safety review should be accomplished within 60 days of testing - typically within 30 days of testing. The coordination and approval of the safety plan (which includes the test plan) should be completed no less than 7 days before test.
>
> Detailed information on mishap accountability and investigating responsibilities must be provided. If the activity involves non-Air Force assets, a pre-mishap plan may need to be developed and coordinated with AFFTC Flight Safety (AFFTC/SEF).
>
> At the discretion of the AFFTC approval authority, all test points expected to be of medium or high safety risk may require validation of customer need as stated in AFMC Policy Directive 99-1.

Figure 2-1 Recommended SOC Safety Review Requirements Statement

2.3. AFFTC Test System Safety Office (AFFTC/SET).

2.3.1. Provide guidance and assistance to project personnel on test safety planning matters that are beyond the scope of the Unit Test System Safety Officer (UTSO) function. Specifically, AFFTC/SET will:

2.3.2. Maintain a copy of all approved unclassified Test Project Safety Review package documentation in the AFFTC/SET office. These packages will be available for review by test teams during their safety planning.

2.3.3. Publish a quarterly AFFTC Test Safety Newsletter providing updated information on AFFTC Form 5028 preparation, recent unexpected test results, unidentified hazards, lessons learned, and other information deemed appropriate by the Chief of Test System Safety for distribution to all UTSOs.

2.3.4. Provide a Test Safety Reviewer from AFFTC/SET to accomplish and ensure an impartial review of the safety planning documentation. The Test Safety Reviewer will act as Chairperson for the Safety Review Board (SRB), if convened.

2.3.5. Provide training to all test safety review process owners/approval authorities (AFFTC Commander, Test Wing Commander, Operations Group Commander, and all Operations Group Commander equivalents.)

2.3.6. Approve UTSO nominees.

2.3.7. Track UTSO currency.

2.3.8. Provide UTSO initial and continuation training, training in support of Test Pilot School curriculum, and any other training beneficial to the application of the test safety process at the AFFTC. Incorporate lessons learned and best practices into appropriate training programs.

2.3.9. Provide a board member for the Configuration Control and Design Review Boards and ensure impartial review of all documentation for T-2 modifications.

2.3.10. Provide control numbers for all AFFTC Forms 5028.

2.3.11. Provide advice to non-AFFTC test agencies, when necessary.

2.3.12. Inspect primary UTSO continuity books and records on an annual basis. Inspection results will be documented with a memorandum addressed to the primary UTSO and coordinated through AFFTC/SE and the Unit Commander.

2.3.13. Maintain this Instruction. Solicit lessons learned from approval authorities, program management, UTSOs, and SRB members so applicable lessons learned may be incorporated into this instruction.

2.4. Test Squadron Commanders (Or Equivalent).

2.4.1. Ensure Project Managers are familiar with this instruction and the provisions of AFMC Sup 1 to AFI 91-202.

2.4.2. Appoint UTSOs and assure their availability to assist project personnel with test safety planning.

2.4.2.1. UTSO qualification requires 6 months AFFTC flight test experience. The USAFTPS course and graduation fulfills initial UTSO training and the 6 months of test experience requirements. Exception: Ground test facilities without personnel meeting the 6-months flight test experience criteria will select UTSOs with the concurrence of the AFFTC Chief of Test System Safety.

2.4.2.2. UTSOs will be designated in writing by Test Squadron Commanders, CTF Deputy Directors, or CTF Chiefs of Engineering

2.4.2.3. For organizations desiring more than one UTSO, coordinate with AFFTC/SET on the appropriate number of UTSOs to meet unit requirements. In order to provide good continuity and consistency of safety packages, the total number of UTSOs in a single unit should be minimized.

2.4.3. Designate a primary UTSO.

2.4.4. Provide SRB members, when required, for review of other AFFTC test programs or activities.

2.5. Unit Test Safety Officer (UTSO).

2.5.1. Assist test teams with preparing all safety-related documentation, including all amendments, both prior to the safety review and during the post safety review cycle.

2.5.2. Review and sign AFFTC Forms 5028/5028A, certifying the documentation complies with the format and standards contained in this instruction prior to sending the package to the AFFTC Test System Safety Office.

2.5.3. Attend UTSO initial training followed by annual currency training/meetings at least once every 12 months.

2.5.4. Disseminate information provided at UTSO continuation training and Lessons Learned/Best Practices Conference.

2.5.5. Maintain a UTSO book in accordance with Figure 2-2.

1. Safety Package Log. (Primary UTSO only) 2. UTSO letter(s) of appointment (for the previous 2 years) 3. Publications: a. AFFTCI 91-5, *AFFTC Test Safety Review Process* b. AFFTCI 99-1, *Test Plans* c. AFMCP 91-1, *Flight Safety and Technical Considerations Guide for Flight Testing* *d.* AFMCPD 99-1, *Test and Evaluation Risk Management* e. AFI 91-202/Supplement 1, *US Air Force Mishap Prevention Program* 4. UTSO meeting minutes 5. General correspondence and reference material to include AFFTC Test Safety Newsletters from AFFTC/SET

Figure 2-2 UTSO Book Contents

2.5.6. In addition, the Primary UTSO will:

2.5.6.1. Provide a tracking and storage system for all AFFTC Form 5028 packages for tests conducted within their organization. The system must track the location of each safety package so that they will be available for reference and/or amendment. Closed packages must be maintained in one location for future reference.

2.5.6.2. Ensure packages are closed at the completion of testing.

2.6. Project Managers (PM).

2.6.1. Coordinate with AFFTC/SET to ensure that specifications, statements of work, etc. incorporate appropriate safety language and/or applicable portions of this instruction.

2.6.2. Ensure a thorough review of the safety aspects of all test/activities involving AFFTC assets (personnel, aircraft, ranges, equipment, facilities, airspace, or the general public when the AFFTC/CC has responsibility for their safety as the Major Range and Test Facility Base Commander). As a minimum, identify and analyze hazards generated by each test or activity and identify minimizing procedures and corrective actions to control risks to an acceptable level. Prepare the AFFTC Form 5028 Safety Package IAW this instruction to meet the safety review timeframes described in Figure 2-1.

2.6.3. Ensure that the requirements of this instruction and AFMC Sup 1 to AFI 91-202 are met prior to and during all phases of testing.

2.6.4. Monitor the unit's Deficiency Reports (DR) program to ensure timely documentation and corrective action on actual or potential aircraft system deficiencies that affect test system safety.

2.6.5. Contact AFFTC/SET following the identification of Category I DRs or mishaps/in-flight emergencies resulting from the test activity.

2.6.6. Attend or monitor Test Plan Working Group and System Safety Group activities at the SPO level as applicable. They should ensure test hazards are identified and controlled as early in the process as possible and should challenge the validity of proposed tests that are likely to be high risk.

2.6.7. Support the Approval Briefing (see paragraph 5.4), by ensuring applicable project personnel (government and contractor) are present at the briefing to answer such questions as may be reasonably expected to arise and provide the necessary administrative support for the slide presentation. Additionally, ensure the test team documents any necessary changes to the AFFTC Form 5028 that result from the presentation to the approval authority.

Chapter 3

SAFETY PLANNING

3.1. General. Safety planning and technical planning are an integral and iterative process. While it may be convenient to assess technical issues separately from safety issues, the smart test team will interweave both throughout the planning process. Attachment 1 provides detailed instructions for preparing the AFFTC Form 5028 safety paperwork.

3.2. Step 1: Identify Hazards. The test team will identify hazards generated by each test or activity (a hazard is any condition that has the potential of causing a mishap). As a minimum the test team will:

3.2.1. Contact other personnel with experience in similar activities or testing and/or review past AFFTC technical reports on similar activities or tests. The AFFTC Technical Library can assist with literature search support.

3.2.2. Review the AFFTC/SET database for hazards identified/lessons learned in other AFFTC test projects of a similar nature.

3.2.3. Review the current AFFTC Lessons Learned database (AFFTC/RMX).

3.2.4. Review the program office and contractor system safety plans and analyses. These include system/subsystem hazard analyses, System Safety Working Group results, and previous test results of the test item including ground, qualification, ground vibration, laboratory, computer simulation, wind tunnel, and static tests. This review will include predicted system performance against established criteria, if such criteria exist. For example, it will specifically compare predicted flying qualities to known industry standards. Where predictions indicate that performance is questionable, this will be identified to the senior decision-makers and the test program risk will be elevated to the appropriate level.

3.2.5. Review AFMCP 91-1, *Flight Safety and Technical Considerations Guide for Flight Testing*, and Attachment 9 of this instruction.

3.2.6. Attempt to identify new hazards that may be unique to the operation of the new system or mission environment.

3.2.7. Complete advance coordination for requirements listed in the SOC to ensure that the safety requirements of each test are addressed in a timely manner and mishap responsibilities are clearly documented.

3.2.8. When non-AFFTC assets/facilities are used, review the safety requirements for those assets/facilities.

3.2.9. Complete advance coordination for any required deviations or waivers to AFFTC, AFMC, or AF publications.

3.3. Step 2: Eliminate/Control Test Hazards. The test team will take action to eliminate the identified test hazards or control them to an acceptable level of risk. To determine the appropriate course of action, the test team will apply the following system safety strategies in the order of precedence listed below:

3.3.1. Design out the test hazard (this may mean eliminating a certain type of test or test points).

3.3.2. Reduce risk through change in test design (for example, increase the build-up test points required. In cases where predictive data is not available, special emphasis will be on adding build-up test points).

3.3.3. Incorporate safety devices (such as installing a spin chute or additional electrical power sources).

3.3.4. Provide caution and warning devices (to include establishing safety of flight/safety of test instrumentation parameters).

3.3.5. Develop procedures or training (this may limit the test participants to a small number of specially trained or qualified personnel).

3.3.6. Accept residual risk. (Only the approval authority can accept residual risk, not the Project Manager.)

3.4. Step 3: Prepare Draft Safety Paperwork. After completing the above steps, the test team will prepare advance copies of the AFFTC 5028 package to include the Test Hazard Analysis (THA). Attachment 2 contains instructions for completion of the THA. All Category I, II, and III hazards unique to the specific test activity will be analyzed on a THA. Time permitting, AFFTC/SET may review draft paperwork if requested by the project, but it should first be reviewed by an UTSO.

3.5. Step 4: Conduct Technical Review. Before conducting the safety review, the test team will schedule and complete a Technical Review IAW AFFTCI 99-1. The technical review will probably result in changes to the Test Plan. The test team will review the technical review results with respect to test safety implications and update the safety documentation accordingly. Obtain documentation from the technical review OPR or designated point of contact verifying that the test plan is technically adequate.

3.6. Step 5: Revise/Review Safety Paperwork. The test team should prepare the documentation required for the safety review. The documentation will represent the test team's collective position on how they will conduct the test. Therefore, internal test team/force/squadron coordination should be completed prior to submission to AFFTC/SET for approval coordination. The test team will:

3.6.1. Prepare advance copies of AFFTC Forms 5028/5028A. These forms shall be reviewed and signed by the PM and UTSO assigned to the project.

3.6.2. Ensure the test plan (or equivalent) is in final format with all changes recommended by the TRB or technical reviewer incorporated. If the changes are not incorporated, a justification letter will be included. Because the safety risk level determines the test plan approval authority, the test plan is approved concurrently with the safety package. When a test plan is not available or applicable, appropriate documentation sufficient to determine scope and activities to be performed will be made available.

3.6.3. Gather supporting documentation, as necessary, to justify hazard analysis and risk assessment. Include this documentation in the safety package. Documentation may include engineering analysis, SEEK EAGLE reports, and results from previous testing.

Chapter 4

SAFETY REVIEW

4.1. General. The AFFTC/SET Test Safety Reviewer will determine if an SRB meeting is required after reading the test documentation package. This determination will be based on the scope, complexity, similarity to previous tests, and anticipated risk level of the test.

4.2. Safety Review Board Meeting Not Required.

4.2.1. The AFFTC/SET Test Safety Reviewer will review the test plan, AFFTC Form 5028, and each AFFTC Form 5028A. Depending on the circumstances, the AFFTC/SET Test Safety Reviewer may request other expert personnel (such as engineering, operations, flight surgeon, aerospace physiologist, bio-environmental, fire department, Quality Assurance, range safety, airfield management, Air Traffic Control/R2508 Central Coordinating Facility or weapons safety representatives) to also review the Test Plan and AFFTC Forms 5028/5028A. Engineering and operations representatives from outside the test squadron will normally review all packages. The program may propose reviewers, but the AFFTC/SET Test Safety Reviewer makes the final determination on who will review and sign the package.

4.2.2. The AFFTC/SET Test Safety Reviewer may still conduct meetings with project personnel and/or reviewers to discuss specific issues or concerns associated with the test even though a SRB is not convened.

4.2.3. The review members will assess the risk of the program IAW Attachment 8. If appropriate, the risk may be assessed separately for AFFTC and non-AFFTC assets, different phases of the test program, or individual test events.

4.2.4. The review members may assign action items and additions. Open items should be closed before starting the coordination cycle. If they cannot be closed, as much detail about the item should be included in the package as possible. The AFFTC/SET Test Safety Reviewer will determine if sufficient detail is included to go forward.

4.3. Safety Review Board Meeting Required.

4.3.1. **Schedule SRB.** After completion of the technical review, the test team will schedule the SRB date and place with AFFTC Test System Safety. The SRB will be scheduled no earlier than 60 days before anticipated start of test, yet early enough to obtain final testing approval at least 7 days before testing. Historically, the time from SRB to test approval is approximately 1 to 2 weeks, depending upon the complexity of the test and the overall risk assessment. The Chief of Test System Safety may approve variations to this timing on a case-by-case basis.

4.3.2. **Select Board Members.** The test team will propose the SRB member composition to the SRB chair for approval. Areas of specialty within the test/activity propose SRB composition. As a minimum, the board will include a chairperson (selected by AFFTC/SET) and two other members (generally an operations representative and an engineering representative). Additionally:

4.3.2.1. SRB members should be senior in test experience in the appropriate disciplines. They will have sufficient experience in the type of test activity to be reviewed, but not have sufficient project involvement to present a personal conflict of interest. Project Managers can use their own personal knowledge about the backgrounds and qualifications of AFFTC personnel when proposing SRB members or they may consult with appropriate engineering division chiefs, squadron operations personnel, or AFFTC/SET. SRB members will not belong to the test team conducting the test.

4.3.2.2. If considered appropriate, additional SRB members will be designated from AFFTC support agencies (e.g., flight surgeon, aerospace physiologist, bio-environmental, Quality Assurance, fire department, range safety, airfield management, Air Traffic Control/R2508 Central Coordinating Facility, or weapons safety representatives). At the discretion of the SRB Chairman and PM, additional members may be selected from outside agencies such as the AF Research Laboratory and AF Operational Test and Evaluation Center.

4.3.2.3. Absence of a voting member can result in cancellation or delay of the SRB at the discretion of the SRB chairperson.

4.3.2.4. Additional members may be added at the discretion of each originally selected SRB member. These members could be used to fill in "gaps" of expertise on the board or provide seasoning for relatively inexperienced AFFTC test personnel.

4.3.2.5. All board members are required to review all material prior to the SRB.

4.3.3. **Prepare for SRB.** In preparation for the SRB, the test team will:

4.3.3.1. Contact the appropriate supervisors of the personnel to serve as board members. This will typically be the discipline branch chief for engineers and the unit operations officer for operations representatives. The test team will provide these names to the SRB chairperson for approval.

4.3.3.2. Notify board members of the date/place of the SRB and provide each board member with a copy of the AFFTC Forms 5028/5028A and the test plan or appropriate documentation (see paragraph 3.6) no later than 3 working days before the SRB.

4.3.3.3. Designate a recorder for the SRB to note action items and changes agreed upon in the course of the meeting.

4.3.3.4. Ensure that applicable project personnel (government and contractor) are available at the SRB to answer such questions as may be reasonably expected to arise. As a minimum, the project manager, the project pilot, (or test conductor for ground tests), and the project engineer will be in attendance.

4.3.4. **Conduct SRB.** The SRB chairperson is responsible for the conduct and control of the SRB. If any SRB members or required personnel are not present, the SRB may be postponed at the discretion of the chairperson. The test team is responsible for the presentations to the board. The board will use the following agenda:

4.3.4.1. Introductions of all personnel present (Chairperson).

4.3.4.2. Brief description of test. The test team will brief the following:

- Background
  - -- AFFTC involvement
  - -- Who requested test
- Test Objectives
- Test Item Description
- System Maturity (to include results from analysis/ground tests/simulation and expected/predicted results)
- Proposed Tests/Methods
  - -- Build Up Rationale
  - -- Progression/Regression Procedures
  - -- Adequacy of Test Matrix (Risk/Benefit Ratio and Analysis)
- Differences from Previous Tests
- Scope (Schedule, Number of Sorties)
- Mishap Responsibilities
  - -- Investigating/Reporting
  - -- Mishap Accountability

Figure 4-1 Test Team Briefing Items at SRB

4.3.4.3. General questions (test team).

4.3.4.4. Review of test plan for specific board member questions (Chairperson).

4.3.4.5. Review of AFFTC Form 5028 and each AFFTC Form 5028A (Chairperson).

4.3.4.6. The SRB voting members will review the test and assess the risk IAW Attachment 8. The risk level may be adjusted based upon expected/predicted results or the absence of predictive data. If appropriate, the risk is assessed separately for AFFTC and non-AFFTC assets, for different phases of the test program, or individual test events. The SRB chairperson makes the final risk assessment if consensus on the assessment is

not reached. An assessment without consensus will be documented in the risk assessment paragraph of the AFFTC Form 5028. Board members will use coordination comments to express dissent inadequately covered in the review synopsis or risk assessment.

4.3.4.7. Following the risk assessment, the PM will review action/open items and additions (Note: Open action items should be closed before starting the coordination cycle. If they cannot be closed, as much detail about the action item should be included in the package as is possible. The AFFTC/SET Test Safety Reviewer will determine if sufficient detail is included to go forward).

Chapter 5

POST-SAFETY REVIEW COORDINATION

5.1. Build Project Package.

5.1.1. The AFFTC/SET reviewer will provide the SRB synopsis to the test team, who will add them to Section V of the final AFFTC Form 5028.

5.1.2. The test team will prepare a complete test documentation package for the coordination process. This documentation package may be arranged in a 3-ring notebook with clearly divided and labeled sections or a 5-part folder, as shown in Table 5-1.

5.1.3. If additional internal test squadron coordination is required, it must be accomplished prior to beginning the safety review member coordination cycle.

5.1.4. After completing the documentation package, the test team will obtain SRB members' signatures on the AFFTC Form 5028 beginning with the chairperson. (If an SRB meeting was held, the SRB Chairman will normally review the package first.) AFFTC/SET will not sign until all safety review members have signed.

Table 5-1 Initial Test Documentation Package Layout

DOCUMENT	BINDER LOCATION	FOLDER LOCATION
Project Title and Control Number	Cover	Outside Cover
AFFTC Form 5028	Front Matter	Inside Front Cover
(Leave Empty)	Tab 1	Tab 1
Technical Adequacy Letter	Tab 2	Tab 2
Test Plan/Training Plan	Tab 3	Tab 3
Supporting Documentation	Tabs As Required	Tabs 4-7

5.2. Approval Coordination Cycle.

5.2.1. Once all review/SRB members have signed the project documentation package, the package will be delivered to AFFTC/SET for Test Safety Division and AFFTC/SE coordination.

5.2.2. The approval authority for the safety package is:

5.2.2.1. LOW RISK: Operations Group Commander for assigned units or equivalent. Operations Group Commander equivalents and the safety packages they approve are listed in Table 5-3.

5.2.2.2. MEDIUM RISK: Test Wing Commander.

5.2.2.3. HIGH RISK: AFFTC Commander.

5.2.3. When a risk assessment contains more than one risk level, the program can request approval of lower risk test points prior to approval of the final overall risk. For example, if a test contains both Low and Medium Risk test points, the Operations Group Commander can approve execution of the low risk points prior to final approval of the overall package by the Wing Commander. The approval to conduct lower risk test points prior to final approval must be documented in the coordination comments of the AFFTC Form 5028 signed by the lower risk approval authority. (For example: "OG/CC signature constitutes approval to begin Low Risk testing.")

5.2.4. Delegation of approval authority for all risk levels will be no lower than the applicable deputy/vice commander. Low risk approval cannot be delegated below the Deputy Operations Group Commander (OG/CD). If the "acting" OG/CC is below OG/CD, low risk approval authority is elevated to the TW/CC.

5.2.5. The coordination cycle and required action for all initial safety review packages will be IAW Table 5-2.

Table 5-2 Initial Safety Review Coordination Cycle

ORGANIZATIONAL LEVEL	LOW RISK	MEDIUM RISK	HIGH RISK
Test Safety Office*	Coord	Coord	Coord
Chief of Safety	Coord	Coord	Coord
Squadron Commander or Equivalent	Coord	Coord	Coord
TW Technical Advisor or Equivalent	Coord	Coord	Coord
Ops Group Commander or Equivalent**	Approve	Coord	Coord
Test Wing Commander or Equivalent	Info	Approve	Coord
AFFTC Commander	Info	Info	Approve

*The Chief of AFFTC/SET will typically sign if a SRB was conducted and the AFFTC/SET Test Safety Reviewer will sign as the SRB Chairperson in Section II of the AFFTC Form 5028, Safety Review Members. If a SRB was not conducted, the AFFTC/SET Test Safety Reviewer will sign in Section III, Coordination and Approval.
**See Table 5-3. Add lines as required for projects requiring joint approval.

Table 5-3 Operations Group Commander Equivalent Approval Authority

OFFICE	SAFETY PACKAGE APPROVAL
TPS/CC	TPS Curriculum training, staff and student test projects.
412 TW/EN	Tests in EN controlled facilities; joint approval with 412 OG/CC or appropriate equivalent if AFFTC assets under their control are involved in the test.
412 LG/CC	Logistics tests conducted in maintenance facilities not associated with a specific test organization or not included as part of a flight test plan. See paragraph 9.6.
EW Test Directorate/ Director	Tests in EW Test Directorate controlled facilities; joint approval with 412 OG/CC or appropriate equivalent if AFFTC assets under their control are involved in the test.

5.3. Comments and Non-Concurrence.

5.3.1. Comments during the coordination cycle are encouraged, as they will ultimately enhance safety planning. Resolution of safety issues at the lowest level is desired.

5.3.2. Coordination comments will be documented in Section V of the AFFTC Form 5028. The coordinating official should notify the test team as early as possible so that the issue can be promptly resolved and documented.

5.3.2.1. The test team will ensure that all coordination comments/issues are resolved, if possible, before forwarding the package to the approval authority. All coordination comments will be retained in the package.

5.3.2.2. The test team will inform AFFTC/SET of any coordination actions that result in a reduced risk assessment or less conservative minimizing procedures or test restrictions.

5.3.3. Coordinating officials who do not concur with the safety review recommendations will notify the AFFTC/SET Test Safety Reviewer immediately. If the non-concurrence cannot be resolved between the non-concurring official, the AFFTC/SET Test Safety Reviewer and the test team, the reasons for non-concurrence will be documented and signed in the Coordination Comments of Section V. The non-concurring official will present the rationale for non-concurrence at the approval authority's briefing. The test team will notify the non-concurring official of the time/date for the approval authority briefing.

5.4. Approval Authority Briefing.

5.4.1. A Formal Approval Briefing is required:

5.4.1.1. At the request of the approval authority.

5.4.1.2. For all HIGH RISK packages.

5.4.1.3. At AFFTC/SET discretion. (Consider risk level, level of effort, accelerated test programs, unique or unusual test programs.)

5.4.2. The safety package should continue through the coordination cycle up to the approval authority prior to conducting the approval briefing. This provides the approval authority the opportunity to review the package to determine if they require a briefing. The approval authority will make the decision whether to take the briefing or not.

5.4.3. The approval authority has the option not to be briefed and just review the package even if an approval briefing has already been scheduled. Whether an approval authority briefing was conducted or not will be documented on the AFFTC Form 5028 in the appropriate column.

5.4.4. The test team will coordinate the meeting time and location with AFFTC/SET. The command authorities below the approval authority will be informed of the confirmed briefing time, date, and place. The test team must ensure that the applicable project personnel (government and contractor) are present at the briefing to answer such questions as may be reasonably expected to arise. As a minimum, a project pilot (or test conductor for ground tests) and a project engineer MUST attend.

5.4.5. At the briefing, the safety review chairperson will introduce the subject of the review and the PM. The PM, or his/her designated representative, will brief the technical portion of the test to include technical objectives, results of literature research for lessons learned or similar programs, resource constraints and results from predicted analysis/simulation using the same format as the safety review briefing, excluding the mishap responsibilities. The AFFTC/SET Test Safety Reviewer will then brief the minutes of the safety review, mishap responsibilities, individual Test Hazard Analyses (AFFTC Forms 5028A), the recommended risk assessment and any coordination comments that have been added. As a general rule, the PM briefs Section IV of the AFFTC Form 5028 and the AFFTC/SET Test Safety Reviewer briefs Section V and the THAs.

5.4.6. Depending on the size of the audience and the meeting facilities, the approval briefing format can vary from a tabletop briefing to a formal slide presentation. The test team will provide the necessary administrative support for the slide presentation. The test team will document any necessary changes to the AFFTC Form 5028 that result from the approval brief.

5.4.7. Signature of the approval authority on the AFFTC Form 5028 and test plan constitutes clearance to begin testing.

5.4.8. After the briefing, the test team will ensure the package continues through the info cycle. The test team should make a copy of the signed AFFTC Form 5028 and all changes so they have a current copy to begin testing.

5.5. Coordination Meetings.

5.5.1. When very little time is available to complete coordination on a package, the test team can request the AFFTC/SET Test Safety Reviewer to schedule a coordination meeting.

5.5.1.1. Coordination meetings are simply approval briefings given to all coordinating officials before they have the opportunity to review the package. The meeting should follow the format for an approval briefing discussed in paragraph 5.4.5 if time permits. Because the coordinating officials will not have an opportunity to review the package, special care needs to be exercised to make sure all parties are fully informed of the planned testing and its associated risks.

5.5.1.2. Coordination meetings are meant to be a valuable tool to expedite test package approval and not an excuse for poor planning. Therefore, they should generally be the exception rather than the rule for completing safety package coordination. However, they can be valuable in promoting candid group discussion about a proposed test activity when a SRB or meeting was not previously accomplished.

5.5.2. AFFTC/SET is the OPR for all coordination meetings. Test teams will not schedule coordination meetings independently of AFFTC/SET. If the PM believes a coordination meeting is necessary but AFFTC/SET does not concur, the PM can request a coordination meeting with the approval authority through their chain of command.

5.6. Information Cycle. If an information official has a comment affecting test conduct, they must immediately notify the test team to resolve the issue. If the issue cannot be resolved, the program will cease testing related to the issue until the issue can be resolved and documented. The issue and resolution will be documented in the coordination comments section of the AFFTC Form 5028. If testing was halted, acceptance of the resolution to the issue will be documented by the information official's signature on the cover of the AFFTC Form 5028.

5.7. Post COORD/APPR/INFO Cycle. After completing the entire coordination/approval/information cycle, the original package will be returned to AFFTC/SET. A copy of the AFFTC Form 5028 will be filed at AFFTC/SET and the test team will be contacted to pickup the safety package. It is the responsibility of the PM to ensure the package returns to AFFTC/SET after coordination is completed. The PM must also ensure the package is filed in accordance with squadron procedures and the primary UTSO is aware of its location.

Chapter 6

TEST CONDUCT

6.1. Test Card Approval.

6.1.1. The test cards for each mission must be approved prior to each mission but no earlier than one week prior to the mission.

6.1.1.1. For LOW RISK tests, the Test Squadron Commander (or equivalent) with test control will approve the cards.

6.1.1.2. For MEDIUM RISK tests, the Operations Group Commander (or equivalent), will approve the cards.

6.1.1.3. For HIGH RISK tests, the Test Wing Commander (or equivalent) will approve the cards.

6.1.2. Once a mission is briefed and the mission slips due to a non-safety related reason, but otherwise remains unchanged, the appropriate approving official may elect to grant approval by telephone or on an "until-flown" basis for up to one week after the original signature. If more than one week has passed since the original approval, the approval authority must be contacted and the date on the signature updated.

6.2. Test Conduct. The procedures/restrictions documented on AFFTC Forms 5028/5028A will be observed while conducting the test. AFFTC Form 5028 requirements take precedence over those specified in the test plan. The test team will ensure:

6.2.1. During test card preparation, the test team reviews general minimizing considerations and AFFTC Forms 5028A, Test Hazard Analysis, to ensure the test cards comply with safety limits or procedural constraints.

6.2.2. The AFFTC Form 5028/5028A procedures and restrictions are addressed during mission briefing IAW local AFFTC directives. As a minimum, all general minimizing considerations and Test Hazards Analyses applicable to that particular mission will be covered during the mission briefing, regardless of the risk level assigned to the test.

6.2.3. The test is conducted within the scope of the approved AFFTC Form 5028, using the procedures and restrictions listed in AFFTC Forms 5028/5028A.

6.3. Unusual Events. An “unusual event” is any occurrence that warrants a safety-related pause in the test program. If an unusual event occurs during the test, the test team will consult with AFFTC/SET and applicable test points will be placed on hold. Unusual events will normally be documented with an amendment. (The short amendment is the minimum option in this case; this is to ensure notification of the chain-of-command.) Testing may be resumed upon completion of the appropriate project change documentation, as described in Chapter 7. Unusual events include, but are not limited to:

6.3.1. Damage to the test article or support equipment.

6.3.2. Exceeding safety of test limits.

6.3.3. Unfavorable departure from predicted simulation/analysis.

6.4. Delays. If the start of testing is delayed more than 45 days after final approval or 3 months after a SRB, the test team will notify AFFTC/SET who will determine if a requirement exists to perform further safety review and if an amendment is required.

Chapter 7

PROJECT CHANGES

7.1. Changes.

7.1.1. Additional safety planning may be required for changes to the test/activity, unexpected results, overly restrictive controls, hazards not previously identified or not adequately controlled, or a change in risk level. (Changes to Test Plans will be IAW AFFTCI 99-1.)

7.1.2. Since the test team is charged with safely conducting the test/activity, the test team must:

7.1.2.1. Determine whether additional safety planning is warranted based on the nature of the change.

7.1.2.2. Ensure that the safety planning is carried out under the provisions of this instruction.

7.1.3. The test team should contact AFFTC/SET to determine the appropriate course of action and documentation. AFFTC/SET will classify the change and determine the approval authority by using the following table:

7.1.4. Risk Assessment: Amendment risk level will be defined as the risk level of the highest risk test point(s) addressed in the amendment with the proposed changes in place. The overall risk level will be defined as the risk level of the highest risk test point(s) addressed in the initial safety package and all subsequent amendments after incorporating the proposed changes.

Table 7-1 Project Changes, Documentation, and Approval

CHANGE CATEGORY	MINIMUM DOCUMENTATION	APPROVAL AUTHORITY
Any potential change in risk level	Long Amendment	Based on risk level
New test plan	Long Amendment	Based on risk level
Major test plan change*	Long Amendment	Based on risk level
Changes to safety planning	Short Amendment	Test Card Approval Authority
Unusual Event (ref 6.3)	Short Amendment	Test Card Approval Authority
Minor test plan change with no changes to safety planning*	Memorandum	Squadron Commander
Administrative	Redline	Project Manager

*Major and minor test plan changes are defined in AFFTCI 99-1.

7.2. Long Amendment.

7.2.1. During the course of testing, information may be obtained that potentially warrants a change in the overall risk level. This could be an increase in the risk based on unexpected results or a decrease in risk level due to increased system maturity. Any change warranting a reevaluation of the overall risk assessment of any test activity, condition, or test points must be documented on a Long Amendment in accordance with paragraph 7.2.4 below. The approval authority for a change in overall risk level corresponds to the highest risk assessment given to the initial package or the amendment. For example, if a series of test points originally assessed as low risk are increased to medium risk, the approval authority is the TW/CC. If the test points were originally medium risk and are being changed to low risk, the TW/CC is still the approval authority. Fundamentally, the initial approval authority must sign off on lowering the overall risk level. AFFTC/SET will determine if the overall risk level warrants reevaluation.

7.2.2. Major Test Plan Change: A major test plan change is defined IAW AFFTCI 99-1. Generally, any changes to test objectives, technical approach or test methodology, or substantive changes to test procedures will require a Long Amendment. A major test plan change is subject to the same level of review as a new test plan and will be documented on a Long Amendment.

7.2.3. New Test Plan: Projects may seek approval of a new test plan using a Long Amendment rather than a completely new safety package. This method may only be used when the new test plan is sufficiently within the scope of the original test plan that little or no changes to safety planning are required. Even though the new test plan may not change any of the safety planning from the previously approved package, the new test plan must be safety reviewed and therefore requires a Long Amendment.

7.2.4. Document all changes requiring a Long Amendment on an AFFTC Form 5028. Attachment 3 contains instructions for completing this form. Essentially, a Long Amendment is identical to an initial AFFTC Form 5028 and must contain all the same paragraphs. (It need not repeat information from the approved package. "No change" may be used for paragraphs unchanged by the amendment.) The amendment should be forwarded in a 5-part folder or equivalent for larger review packages, as shown in Table 7-4. Coordination/approval levels for Long Amendments are in Table 7-2.

Table 7-2 Long Amendment Safety Review Coordination Cycle

ORGANIZATIONAL LEVEL	LOW RISK	MEDIUM RISK	HIGH RISK
Test Safety Officer*	Coord	Coord	Coord
Chief of Safety	Coord	Coord	Coord
Squadron Commander or Equivalent	Coord	Coord	Coord
TW Technical Advisor or Equivalent	Coord	Coord	Coord
Ops Group Commander or Equivalent**	Approve	Coord	Coord
Test Wing Commander or Equivalent	Info	Approve	Coord
AFFTC Commander	Info	Info	Approve

*The Chief of AFFTC/SET will typically sign if a SRB was conducted and the AFFTC/SET Test Safety Reviewer will sign as the SRB Chairperson in Section II of the AFFTC Form 5028, Safety Review Members. If a SRB was not conducted, the AFFTC/SET Test Safety Reviewer will sign in Section III, Coordination and Approval.
**See Table 5-3. Add lines as required for projects originally requiring joint approval.
NOTE: PMs and UTSO signatures are required on the amendment before start of coordination.

7.3. Short Amendment.

7.3.1. Any change to the General Minimizing Considerations (GMC) or THAs is considered a change to safety planning. The desired changes may be more restrictive or less restrictive than the approved safety planning. Changes to safety planning typically result from an unexpected test result requiring additional planning or a programmatic constraint leading to a request to remove overly restrictive safety planning. A change in safety planning that does not fall into the categories requiring a Long Amendment (potential change in risk level, new test plan, or major test plan change) can be documented on a Short Amendment in accordance with the following paragraph.

7.3.2. Document all changes requiring a Short Amendment on an AFFTC Form 5028. Attachment 4 contains instructions for completing this form. The amendment should be forwarded in a 5-part folder or equivalent, as shown in Table 7-4. Coordination/approval levels for Short Amendments are in Table 7-3. Although a Short Amendment goes through similar coordination as a Long Amendment, testing can resume after obtaining the signatures of the AFFTC Chief of Safety (AFFTC/SE) and the approval authority if time is critical (typically interpreted as less than 24 hours). All other coordination signatures will be obtained after approval.

Table 7-3 Short Amendment Safety Review Coordination Cycle

ORGANIZATIONAL LEVEL	LOW RISK	MEDIUM RISK	HIGH RISK
Test Safety Officer*	Coord	Coord	Coord
Chief of Safety	Coord	Coord	Coord
Squadron Commander or Equivalent	Approve	Coord	Coord
TW Technical Advisor or Equivalent	Info	Coord	Coord
Ops Group Commander or Equivalent**	Info	Approve	Coord
Test Wing Commander or Equivalent	Info	Info	Approve
AFFTC Commander	Info	Info	Info

*The Chief of AFFTC/SET will typically sign if a SRB was conducted and the AFFTC/SET Test Safety Reviewer will sign as the SRB Chairperson in Section II of the AFFTC Form 5028, Safety Review Members. If a SRB was not conducted, the AFFTC/SET Test Safety Reviewer will sign in Section III, Coordination and Approval.
**See Table 5-3. Add lines as required for projects originally requiring joint approval.
NOTE: PMs and UTSO signatures are required on the amendment before start of coordination.

7.4. Memorandum Change.

7.4.1. When the test team, after consulting with AFFTC/SET, determines a minor test plan change (IAW AFFTCI 99-1) does not change the safety planning, the test team may document the change on a memorandum. Approval of the memorandum is obtained from the Squadron Commander or equivalent. AFFTC/SET safety reviewer concurrence is required.

7.4.2. With regard to test points, a memorandum may be used to document changing the flight conditions of test points or adding test points provided the new conditions are within the approved envelope of test points. A memorandum may also be used to delete test points that are not part of safety build-up.

7.4.3. Instructions for completing a memorandum change may be found in Attachment 5. Testing with the changes in place may be conducted once an AFFTC/SET safety reviewer has signified concurrence and the Squadron Commander (or equivalent) has approved the memorandum.

7.5. Administrative Change.

7.5.1. Some changes to the approved safety package may be classified as administrative only. An administrative change clarifies information contained in the package and does not affect test conduct or safety planning. The PM may make red line changes (with PM initials) without consulting with AFFTC/SET.

7.5.2. The PM must thoroughly question the background and implications of all administrative changes to ensure they would not benefit from additional review. Any change may be an indication of inadequate safety planning, no matter how minor it originally appears. If in doubt, the PM is encouraged to consult with AFFTC/SET.

7.6. Amendment Coordination.

7.6.1. Comments during the coordination cycle of all amendments are encouraged, as they will ultimately enhance safety planning. Resolution of safety issues at the lowest level is desired.

7.6.2. Coordination comments will be documented in Section V of the AFFTC Form 5028. Before adding a comment, notify the test team so that the issue can be resolved and closure documented in the coordination comment. The test team will ensure that all coordination comments/issues are resolved, if possible, before forwarding the package to the approval authority. Coordination comments that alter minimizing procedures, risk assessments, or add test restrictions will be coordinated with the review board members by contacting the test team or the AFFTC/SET Test Safety Reviewer. All coordination comments will be retained in the package.

7.6.3. Coordinating officials who do not concur with the safety review recommendations will notify the AFFTC/SET Test Safety Reviewer immediately. If the non-concurrence cannot be resolved between the non-concurring official, the AFFTC/SET Test Safety Reviewer and the test team, the reasons for non-concurrence will be documented and signed in the coordination comments section of the AFFTC Form 5028. For resolution

of the issue, the non-concurring official will present the rationale for non-concurrence at the approval authority's briefing. The test team will notify the non-concurring official of the time/date for the approval authority briefing.

7.6.4. The approved amendment will continue through the information cycle. If an information official has a comment affecting test conduct, they must immediately notify the test team to resolve the issue. If the issue cannot be resolved, the program will cease testing related to the issue until the issue can be resolved and documented. The issue and resolution will be documented in the coordination comments section of the AFFTC Form 5028. If testing was halted, acceptance of the resolution to the issue will be documented by the information official's signature on the cover of the AFFTC Form 5028.

7.6.5. After completing the entire coordination/approval/information cycle, the safety package will be returned to AFFTC/SET. A copy of the AFFTC Form 5028 will be filed at AFFTC/SET and the test team will be contacted to pickup the safety package. It is the responsibility of the PM to ensure the package returns to AFFTC/SET after coordination is completed. The PM must also ensure the package is filed in accordance with squadron procedures and the primary UTSO is aware of its location.

Table 7-4 Test Amendment Package Layout

DOCUMENT	BINDER LOCATION	FOLDER LOCATION
Project Title and Control Number	Cover	Outside Cover
AFFTC Form 5028 Amendment, with all attachments	Front Matter	Inside Front Cover
Initial AFFTC Form 5028 and all previous amendments	Tab 1	Tab 1
Technical Adequacy Letter	Tab 2	Tab 2
Past Test Plans/Training Plans	Tab 3	Tab 3
Supporting Documentation	Tabs As Required	Tabs 4-7

7.7. Safety Package Duration and Change Limits.

7.7.1. Safety packages are valid for 1 year from the initial approval date or the approval date of the most recent Continuation Amendment. If the test team intends to test past that date, the team must have an approved Continuation Amendment IAW Attachment 6. This amendment documents lessons learned and updates the chain of command on the progress of the test. It will not be used to document changes that would normally be approved with a separate amendment.

7.7.2. If the safety package accumulates more than 10 amendments or a heavily amended package becomes difficult to use, consideration will be given to consolidating the initial package and amendments into a new package and closing the first. As a minimum, the test team must ensure that all THAs and GMCs are clearly presented. This may be accomplished by incorporating all current GMCs and THAs into the latest amendment in order to simplify reviewing and briefing the minimizing procedures.

Chapter 8

PROJECT COMPLETION

8.1. Closure Amendment.

8.1.1. The closure amendment is the final step in the overall safety review process to ensure lessons learned are fully documented and can be applied to future programs.

8.1.2. Complete the AFFTC Form 5028, Closure Amendment. At the completion of test plan execution, the test team will document safety lessons learned on a closure amendment to the safety package IAW Attachment 7.

8.1.3. AFFTC/SET may forward the amendment up the chain of command for information only.

8.2. Disposition of Closed Packages.

8.2.1. Once a safety package is closed, it may not be re-opened.

8.2.2. The primary UTSO will maintain all closed packages for no less than 5 years.

Chapter 9

SPECIAL PROCEDURES

9.1. Safety Planning when AFFTC is not the Responsible Test Organization (RTO).

9.1.1. Safety Planning. Safety planning must always be accomplished to assess the risk to AFFTC assets. The scope of the safety planning will be restricted to assessing the risk to AFFTC assets only unless a broader scope is requested by the RTO. Sufficient detail must be included in the package to assess the risk to AFFTC assets. The safety package may include contractor or RTO provided safety planning but will, as a minimum, use an AFFTC Form 5028 to obtain approval from senior leadership for AFFTC participation. (Specific procedures may be found in Chapter 9 of this instruction.)

9.1.2. Technical Review. The Review Synopsis paragraph of the AFFTC Form 5028 will clearly state whether or not an AFFTC technical review was conducted. A complete test plan is not required in the safety package but sufficient detail about the planned test conditions, procedures, and techniques must be included to perform the safety risk assessment to AFFTC assets.

9.2. Test Pilot School (TPS).

9.2.1. Curriculum events (including curriculum sorties, and flight training programs) will be safety reviewed IAW paragraph 9.5.

9.2.2. Student test plan SRBs may be held in conjunction with the TPS TRB providing the TPS staff monitor and AFFTC/SET are satisfied that the test plan is sufficiently mature for safety review prior to the combined TRB/SRB.

9.2.3. The test card approval authority for TPS student test management projects and staff projects will be:

9.2.3.1. The USAF TPS Operations Officer for LOW RISK test cards. (May only be delegated upward.)

9.2.3.2. The USAF TPS Commandant for MEDIUM RISK test cards. (May be delegated to the Deputy Commandant.)

9.2.3.3. TW/CC for all HIGH RISK test cards. (May be delegated to the Vice Commander.)

9.3. Non-AFFTC Agencies.

9.3.1. For NASA, Air Force Research Laboratory Propulsion Directorate and other agencies with an inter-service support or AFFTC Host-Associate Agreement:

9.3.1.1. These organizations will review test plans within their area of responsibility and notify the Chief of AFFTC/SET (before the start of testing) of any potentially high risk test activity or any test activity that will affect normal AFFTC operations. AFFTC/SET will advise the organization of any requirement to submit a Flight Crew Information File (FCIF) item to the 412 OG.

9.3.1.2. Tests that involve AFFTC assets (other than airspace, range, and airfield support of normal flight operations) will be safety reviewed by AFFTC. The activity's internal safety review process may meet AFFTC requirements. AFFTC/SET will make this determination and, if warranted, participate in the safety review. The AFFTC PM will use the AFFTC Form 5028 to document the process and gain approval for AFFTC participation.

9.3.1.3. The NASA-Dryden Flight Readiness Review (FRR) and Airworthiness and Safety Review Board (AFSRB) process is recognized by AFFTC as meeting the requirements of this instruction. AFFTC/SET is generally invited to participate as a non-voting member of the AFSRB for projects that may affect AFFTC operations.

9.3.2. For government and civilian agencies, without an inter-service support or AFFTC Host-Associate Agreement, the AFFTC PM, or liaison officer for these tests, will ensure that the requirements of this instruction are met for all testing involving AFFTC resources, which may include reviews as outlined in paragraph 9.3.1.2 above.

9.4. Accelerated Tests.

9.4.1. Test programs must be designated as "accelerated tests" by the 412 TW/CC.

9.4.2. Accelerated tests must comply with all documentation and review requirements specified by this instruction.

9.4.3. The steps of the process may be compressed in order to minimize the time required for final test approval. This is typically accomplished by combining the TRB and SRB then conducting an approval briefing to all coordinating officials simultaneously (coordination meeting) to obtain their signatures on the safety package.

9.5. Locally Created Publications. Locally created publications, including supplements to AF or AFMC publications, may be subject to safety review IAW this instruction at the discretion of the publication approval authority. This process is very similar to that for test projects. The differences are detailed below:

9.5.1. A Technical Review Board is not required.

9.5.2. All minimizing procedures will be incorporated as guidance in the publication/supplement. The safety package will document the review process and include GMCs and/or THAs justifying safety-related guidance in the publication. A reference to the safety package tracking number will be made in the publication.

9.5.3. As a minimum, the safety review board will consist of representatives with the following backgrounds:

9.5.3.1. One operations representative with relevant experience in each aircraft type affected by the publication.

9.5.3.2. One engineering representative with knowledge or experience in the system or type of flying affected by the publication. An additional operations representative may be substituted if engineering representation is unnecessary.

9.5.4. For LOW RISK packages, approval authority will be no lower than the publication approval authority. For all elevated risk packages, the approval authority will be the highest of the publication approval authority and a level equivalent to that for safety package approval. The 412 Test Wing Technical Advisor need not coordinate.

9.5.5. The safety package will be closed when the publication/supplement is approved. The closure amendment will specifically state the publication/supplement number, title, and effective date.

9.5.6. Changes to the publication/supplement require consultation with AFFTC/SET to determine if additional safety planning is required.

9.6. Ground Tests.

Ground testing that is not a part of a flight test plan may include, but are not limited to, tests conducted in EN, EW, or LG facilities and any temporary maintenance procedure where technical data, such as a technical order (TO) or contractor technical data, is not available.

9.6.1. Any test which lies within the scope outlined in paragraph 1.2 will comply with all requirements of this instruction.

9.6.2. For logistics validation/verification actions for TO and support equipment testing:

9.6.2.1. Review will be done only after the SPO has approved the requests for combined validation/verification.

9.6.2.2. Multiple test plans can be grouped together in a single safety package for those validation/verification tests and support equipment tests that 412 TW/ENRL (Logistics Test Flight) has determined to be low risk.

Table 9-1 412 TW/EN Safety Review Coordination Cycle

ORGANIZATIONAL LEVEL	LOW RISK	MEDIUM RISK	HIGH RISK
Test Safety Office*	Coord	Coord	Coord
Chief of Safety	Coord	Coord	Coord
Squadron Commander or Equivalent	Coord	Coord	Coord
412 TW/ENRL	Coord	Coord	Coord
412 TW/EN**	Approve	Coord	Coord
Test Wing Commander or Equivalent	Info	Approve	Coord
AFFTC Commander	Info	Info	Approve

*The Chief of AFFTC/SET will typically sign if a SRB was conducted and the AFFTC/SET Test Safety Reviewer will sign as the SRB Chairperson in Section II of the AFFTC Form 5028, Safety Review Members. If a SRB was not conducted, the AFFTC/SET Test Safety Reviewer will sign in Section III, Coordination and Approval.

**See Table 5-3. Add lines as required for projects requiring joint approval.

Chapter 10

FORMS PRESCRIBED

10.1. Forms Prescribed. AFFTC Form 5028, **Test Project Safety Review (Initial and Amendment)** will be used to document and approve safety planning and amendments to safety planning. AFFTC Form 5028A, **Test Hazard Analysis (THA)** will be used to document specific test hazards.

WILBERT D. PEARSON, JR.
Major General, USAF
Commander

Attachment 1

INSTRUCTIONS FOR USE OF AFFTC FORM 5028—INITIAL

A1.1. Use. The AFFTC Form 5028 introduces and summarizes the test, documents the research of lessons learned, records the proceedings of the SRB meeting, and provides a vehicle by which the AFFTC command structure gives the final approval for the conduct of the test.

A1.2. Preparation.

A1.2.1. The test team completes Sections I through III of the AFFTC Form 5028, except the risk level block. (AFFTC/SET provides the test team with the Control Number). The risk level block is filled in after the reviewers determine risk.

A1.2.2. The test team is responsible for the completion of Sections IV and V, with the exception of the Review Synopsis (safety review), Action Items, and Risk Assessment, which will be provided by AFFTC/SET.

A1.2.3. An example is provided in the following pages.

A1.3. UTSO Check. After the test team has completed a rough draft of the AFFTC Form 5028, an UTSO should review the form. This will ensure the test team gets the benefits of the latest safety guidelines and completes the form IAW AFFTCI 91-5. The UTSO will not sign the AFFTC Form 5028 until the UTSO is comfortable that the safety planning accomplished by the test team is sufficient and that the completed form meets AFFTCI 91-5 guidelines.

TEST PROJECT SAFETY REVIEW (INITIAL OR AMENDMENT)
(Refer to AFFTCI 91-5 for complete instructions)

I. PROJECT INFORMATION

INITIAL PROJECT TEST TITLE	OVERALL RISK LEVEL	CONTROL NUMBER	TEST AGENCY
F-37 Super Squirrel Missile Integration	MEDIUM	2005034	416 FLTS

SUBJECT OF AMENDMENT ☐OVERALL RISK CHANGE ☐LONG AMENDMENT ☐SHORT AMENDMENT	AMENDMENT RISK LEVEL	CHANGE NUMBER	PROJECT JON
N/A	N/A		111SSM00

PROJECT MANAGER (Typed Name and Grade)	SIGNATURE	EMAIL ADDRESS	PHONE NUMBER	DATE
Phillip P. Smith, NH-III		phil.smith@edwards.af.mil	73217	
UNIT TSO (Typed Name and Grade)	SIGNATURE	EMAIL ADDRESS	PHONE NUMBER	DATE
Roger L. Jones, Capt		roger.jones@edwards.af.mil	75297	

II. SAFETY REVIEW MEMBERS

NAME, GRADE	TITLE	SIGNATURE	DATE	COORD COMMENT? YES	NO
Betty T. Underwood, NH-III	SRB Chairman, AFFTC/SET				
Craig B. Tiller, Maj	Operations, 411 FLTS				
Terrence Q. Mitchell, NH-IV	Avionics, 412 TW/ENV				
Orren R. Manor, NH-III	Flight Dynamics, 412 TW/ENF				

III. COORDINATION AND APPROVAL

POSITION TITLE	SIGNATURE	DATE	ACTION (COORD, APPROVE, INFO, OR N/A)	COORD COMMENT? YES	NO	APPROVAL BRIEF YES	NO
TEST SAFETY OFFICER AFFTC/SET			Coord				
CHIEF OF SAFETY AFFTC/SE			Coord				
SQUADRON COMMANDER (OR EQUIVALENT) 416 FLTS/CC			Coord				
TW TECHNICAL ADVISOR (OR EQUIVALENT) 412 TW/CA			Coord				
GROUP COMMANDER (OR EQUIVALENT) N/A							
GROUP COMMANDER (OR EQUIVALENT) 412 OG/CC			Coord				
TEST WING COMMANDER (OR EQUIVALENT) 412 TW/CC			Approve				
AFFTC COMMANDER (OR AS DELEGATED) AFFTC/CC			Info				

RETURN TO AFFTC/SET PRIOR TO FILING AT THE ORIGINATING UNIT

AFFTC FORM 5028 Sep 2001 (EF) Replaces Forms 5028, Dec 96, which will not be used

Figure A1-1 Initial 5028 Example

25 Mar 2001 Initial Package [Insert Package Number Here] 5028 Remarks 1/3

SECTION IV: PROJECT DESCRIPTION

1. BACKGROUND

Describe the reason for testing or training along with AFFTC involvement. This answers the "Who, What, Where, and Why" questions about the test. Include who is tasking you to do the test, who the Responsible Test Organization is, what Participating Test Organizations are involved, and what AFFTC assets are at risk if it is not obvious, i.e. the test article may not be an AFFTC asset but the people involved are.

2. TEST (TRAINING) OBJECTIVES

Describe test or training objectives. These are generally the top-level objectives listed in the test plan.

a. First objective.

b. Second objective.

3. TEST ITEM DESCRIPTION

Describe the article or system on which testing or training is to be accomplished, including unique configurations. Provide sufficient detail to point out the possible safety concerns associated with the test item design. In addition, include facilities to be used.

4. SYSTEM MATURITY

Describe the maturity of the article, system, or facility to be used. This includes a synopsis of the laboratory testing, ground simulation, and previous flight experience on the system.

5. PREDICTED/EXPECTED RESULTS

Describe anticipated results from simulation/analysis. This should be the project's best prediction of the most credible outcome of the test. Special emphasis should be on documenting any expected results that affect the safe conduct of the test. If there are no predictions available, state the following "No predictive performance is available from analysis or simulation." This statement should be followed with the project's expected results based on their experience and knowledge of the test program.

6. TYPES OF TESTS (TRAINING)

Identify the maneuvers to be accomplished during the test or training program and the envelope the aircraft will operate in. Also include any unique test techniques, if applicable. Provide sufficient detail for the reader to understand potential safety concerns (e.g. lowest altitude, highest airspeed, number of aircraft, steepest dive angle, types of weapons) without having to reference the test point matrices in the test plan. This paragraph answers the "How" about the test.

7. DIFFERENCES FROM PREVIOUS TESTS

Describe differences from previous or similar programs. Highlight the similarities to previous tests if there are no differences.

8. SCOPE

Describe the schedule, anticipated start date for proposed test/training, program duration, and number of sorties. This answers the "When" about the test.

SECTION V: SAFETY REVIEW SUMMARY

1. REVIEW SYNOPSIS

Technical Review: A summary of the tech review.
Safety Review: A summary of the safety review. The SRB minutes go here.

2. REFERENCES

List those resource documents/lessons learned you reviewed to prepare the safety planning. This section must include AFMCP 91-1 and should include a minimum of three other previously approved AFFTC Safety Packages covering similar testing.

a. AFMCPAM 91-1

b. AFFTCI 91-5

c. Reference 3

3. MISHAP RESPONSIBILITIES

Identify mishap responsibilities (mishap investigating/reporting responsibilities and accident accountability) for each article, system, personnel, or facility to be involved with this program. This may require references to Memorandums of Agreement, which may need to be included in the supporting documentation. When this information is not clearly spelled out in AFI 91-204, the customer may be required to develop a written mishap plan to be coordinated with AFFTC Flight Safety (AFFTC/SEF) and included in the safety review package before beginning any test activity.

4. GENERAL MINIMIZING CONSIDERATIONS

Describe general minimizing procedures and considerations to be adhered to during the duration of the program. Some minimizing procedures and remarks from the THA may be repeated here for extra emphasis. This section discusses minimizing considerations and not just procedures. Therefore, some statements (procedures) have "will" and "shall" while other statements will be remarks giving general safety related information to be considered when assessing the risk of the test.

a. First GMC.

b. Second GMC.

5. TEST HAZARD ANALYSES

List the THAs attached by title.

a. Title of First THA: Hazard category/Probability

b. Title of Second THA: Hazard category/Probability

6. QUALIFICATION AND TRAINING

Describe the additional qualifications and training team members must have to participate in the program. Team members may include the aircrew, control room crew, and any other individuals critical to the safe accomplishment of the activity. If no additional qualifications or training are required beyond the normal day-to-day requirements for the team members, write "No additional qualifications and/or training are required."

7. TEST ARTICLE RESTRICTIONS

Describe unique test safety related restrictions (other than those already identified in the general minimizing considerations above) that limit the program in some fashion.

8. SPECIAL CONSIDERATIONS

Describe items given special consideration (such as test sortie length, sortie complexity, or the addition of a special piece of equipment). Generally, any notable information that does not fit in any of the other paragraphs can be included here.

9. ACTION ITEMS

List action items identified during the safety review, along with the corresponding responses. Action items need to be resolved prior to initiating final coordination. The format should state the action item followed by the response, ending with CLOSED or OPEN.

a. Action item text. (Action assigned to)
Action item closure. CLOSED/OPEN

b. Action item text. (Action assigned to)
Action item closure. CLOSED/OPEN

10. RISK ASSESSMENT

Identify the proposed risk for this program and the reasoning behind why the risk level was assigned. An overall risk can be assigned or various risk levels can be assigned to particular test points or phases. The highest risk level assigned to any part of the test is what goes on the cover of the AFFTC Form 5028 and determines the approval authority. If applicable, identify a separate risk for both AFFTC and non-AFFTC assets. The risk to non-AFFTC assets does not affect the approval authority or test card signature authority.

11. COORDINATION COMMENTS

Leave blank and provide enough space, for multiple comments. Attach a blank piece of paper if less than half of the page is available for comments.

Attachment 2

INSTRUCTIONS FOR USE OF AFFTC FORM 5028A

A2.1. General. The AFFTC Form 5028A, **Test Hazard Analysis (THA)** documents each hazard and the actions the project will take to control each hazard to an acceptable level of risk.

A2.2. Step 1 - Confirm The Hazard Is Test Unique.

A2.2.1. Confirm that the hazard is not just a hazard associated with the basic operation of the aircraft, test article, vehicle, system under test, or facility. If the hazard is not unique to your series of test, no THA is required. For example, midair collision with non-participating aircraft and bird strikes are not generally considered test unique hazards.

A2.2.2. However, should the very nature of the test increase the probability of these hazards above that of normal operations, they should be addressed as test unique hazards. If in doubt, consult your UTSO or AFFTC/SET.

A2.3. Step 2 - Define Hazard, Cause, And Effect.

A2.3.1. Hazard - Any condition that has the potential of causing a mishap.

A2.3.2. Cause - Anything that could lead to the presence of the hazard. This is the cause of the hazard, not the mishap (effect).

A2.3.3. Effect - The mishap you are trying to prevent. The only choices for effect are:

Table A2-1 Hazard Effect vs. Category

EFFECT	CATEGORY
Death Loss of System/Facility Severe Environmental Damage	I (CATASTROPHIC)
Severe Injury Severe Occupational Illness Major System/Facility/Environmental Damage	II (CRITICAL)
Minor Injury Minor Occupational Illness Minor System/Facility/Environmental Damage	III (MARGINAL)
Negligible	IV (NEGLIGIBLE)

A2.3.4. If the hazard you identified could not ultimately cause one of the above effects, then it is not a hazard in the context of the AFFTC test safety review process.

A2.3.5. If the effect is negligible, the THA is generally not required. Any minimizing procedures that would have been included in the THA can go in the GMC section of the AFFTC Form 5028.

A2.3.6. See Table A8-2 for a complete definition of the hazard severity categories. Table A8-1 contains the definitions for hazard probabilities.

A2.4. Step 3 - Outline the Minimizing Procedures. This is the section where you describe your plan for preventing the hazard or reducing the probability of occurrence of the hazard. In general, these are the limitations you are placing on your project. If it is not an action or procedure (has the word "will" or "shall" in it) followed during preparation or conduct of the test, then it probably belongs in the remarks section and possibly in the GMC section of the AFFTC Form 5028. Each minimizing procedure should reference by number the specific cause(s) identified in step 2 that you are trying to control. If the minimizing procedure cannot be tied to a specific cause(s), you may have another cause you have not yet identified or the minimizing procedure may be a remark or GMC. The minimizing procedures attempt to break the chain of events linking the causes to the hazard.

A2.5. Step 4 - Outline the Corrective Action. This is the list of actions to take to prevent or mitigate a mishap (the effect) if the hazard occurs. This should cover the control room, ground personnel, flight crew, and anyone else the situation calls for. If you do not have any test unique procedures to deal with the situation (i.e., if the procedure is already called out for in the flight manual), state you will follow flight manual procedures. The corrective action attempts to break the chain of events linking the hazard to the mishap.

A2.6. Step 5 - Document Remarks. In general, remarks provide additional information that would help better assess the risk involved in the test. In most cases, the AFFTC Form 5028 review during preflight briefings will focus on the GMCs, minimizing procedures and corrective action sections and seldom mention the remarks. Therefore, if something is not an action or limitation, it probably belongs in the remarks section. The object is to talk only about actions relevant to the conduct of the test during the preflight briefing. Extraneous remarks in the Minimizing Procedures or Corrective Actions sections tend to lessen the effectiveness of the preflight safety review.

A2.7. Step 6 - UTSO Check. After the test team has completed a rough draft of the AFFTC Form 5028A, an UTSO should review the form. This will ensure the test team gets the benefits of the latest safety guidelines and completes the form IAW AFFTCI 91-5. The UTSO will not sign the AFFTC Form 5028A until the UTSO is comfortable that the safety planning accomplished by the test team is sufficient and that the completed form meets AFFTCI 91-5 guidelines.

TEST HAZARD ANALYSIS (THA)		Page 1/1
TEST SERIES F-35 Brake Performance Test		HAZARD CAT/PROBABILITY II/OCCASIONAL
PREPARED BY (NAME AND TITLE) Charles T. Fitch, NH-III	SIGNATURE	
UNIT TEST SAFETY OFFICER (TYPE NAME AND GRADE) Terry P. Schultz, Capt	SIGNATURE	

HAZARD: Hot Brakes/Landing Gear Fire

CAUSE: 1. Excessive brake energy
2. Flammable material near brakes
3. Improper pilot technique
4. Excessive differential braking

EFFECT: Severe Injury, Major System Damage

MINIMIZING PROCEDURES:

1. (1, 3) Mission control and the flight crew will monitor the brake temperature real-time. Brake temperature must be less than 100 deg F or 20 deg F above ambient (whichever is higher) prior to proceeding to the next test point.
2. (1,3) Test points will be performed in a build-up fashion from low to high energy.
3. (1,2,3,4) For all tests where brakes are expected to be in the flight manual caution zone, the Fire Department will be positioned on the taxiway nearest the planned stopping point.
4. (2) Ground crew will inspect the landing gear prior to each test point.
5. (3) Prior to conducting taxi tests, pilots will practice braking techniques in the simulator.
6. (4) Brake energy envelope expansion will not be conducted with crosswind exceeding 5 knots.

CORRECTIVE ACTIONS:

1. The flight crew will declare a ground emergency, follow flight manual procedures and then comply with the CTF Hot Brake OI.
2. No personnel will approach the landing gear until 15 minutes after brake temperatures have peaked or fuse plugs in both wheels have released.

REMARKS:

1. Tires are equipped with fuse plugs to release tire pressure in the event of wheel/brake overheating.
2. Hydraulic lines are equipped with fuses to minimize hydraulic fluid leakage should a hydraulic leak occur.

Figure A2-1 AFFTC Form 5028A (THA) Example

Attachment 3

INSTRUCTIONS FOR USE OF AFFTC FORM 5028—LONG AMENDMENT

A3.1. Use. Use care to minimize unnecessary repetition of information unchanged from the approved package.

A3.2. Preparation.

A3.2.1. The test team fills out Sections I through III of the AFFTC Form 5028, except the risk level block. Address changes from the approved safety package. Paragraphs that have not changed should state "No change."

A3.2.2. The test team is responsible for the completion of Sections IV and V, with the exception of the Review Synopsis (safety review), Action Items, and Risk Assessment.

A3.2.3. An example is provided in the following pages.

A3.3. UTSO Check. After the test team has completed a rough draft of the AFFTC Form 5028, an UTSO should review the form. This will ensure the test team gets the benefits of the latest safety guidelines and completes the form IAW AFFTCI 91-5. The UTSO will not sign the AFFTC Form 5028 until the UTSO is comfortable that the safety planning accomplished by the test team is sufficient and that the completed form meets AFFTCI 91-5 guidelines.

TEST PROJECT SAFETY REVIEW (INITIAL OR AMENDMENT)
(Refer to AFFTCI 91-5 for complete instructions)

I. PROJECT INFORMATION

INITIAL PROJECT TEST TITLE	OVERALL RISK LEVEL	CONTROL NUMBER	TEST AGENCY
F-37 Super Squirrel Missile Integration	MEDIUM	2005034	416 FLTS

SUBJECT OF AMENDMENT ☐OVERALL RISK CHANGE ☒LONG AMENDMENT ☐SHORT AMENDMENT	AMENDMENT RISK LEVEL	CHANGE NUMBER	PROJECT JON
Addition Of Project "Sniffer" Radar Mode Test Points	MEDIUM	1	111SSM00

PROJECT MANAGER (Typed Name and Grade)	SIGNATURE	EMAIL ADDRESS	PHONE NUMBER	DATE
Phillip P. Smith, NH-III		phil.smith@edwards.af.mil	73217	
UNIT TSO (Typed Name and Grade)	SIGNATURE	EMAIL ADDRESS	PHONE NUMBER	DATE
Roger L. Jones, Capt		roger.jones@edwards.af.mil	75297	

II. SAFETY REVIEW MEMBERS

NAME, GRADE	TITLE	SIGNATURE	DATE	COORD COMMENT? YES	NO
Craig B. Tiller, Maj	Operations, 411 FLTS				
Terrence Q. Mitchell, NH-IV	Avionics, 412 TW/ENV				

III. COORDINATION AND APPROVAL

POSITION TITLE	SIGNATURE	DATE	ACTION (COORD, APPROVE, INFO, OR N/A)	COORD COMMENT? YES	NO	APPROVAL BRIEF YES	NO
TEST SAFETY OFFICER AFFTC/SET			Coord				
CHIEF OF SAFETY AFFTC/SE			Coord				
SQUADRON COMMANDER (OR EQUIVALENT) 416 FLTS/CC			Coord				
TW TECHNICAL ADVISOR (OR EQUIVALENT) 412 TW/CA			Coord				
GROUP COMMANDER (OR EQUIVALENT) N/A							
GROUP COMMANDER (OR EQUIVALENT) 412 OG/CC			Coord				
TEST WING COMMANDER (OR EQUIVALENT) 412 TW/CC			Approve				
AFFTC COMMANDER (OR AS DELEGATED) AFFTC/CC			Info				

RETURN TO AFFTC/SET PRIOR TO FILING AT THE ORIGINATING UNIT

AFFTC FORM 5028 Sep 2001 (EF) Replaces Forms 5028, Dec 96, which will not be used

Figure A3-1 Long Amendment AFFTC Form 5028 Example

SECTION IV: PROJECT DESCRIPTION

1. BACKGROUND

Describe the reason for the amendment. Do not just repeat the words in the initial AFFTC Form 5028. Include enough information from the initial background paragraph to lay the foundation for the amendment. This paragraph answers the "Who, What, Where, and Why" questions about the changes being made to the approved package.

2. TEST (TRAINING) OBJECTIVES

Describe test or training objectives that have changed.

a. First objective.

b. Second objective.

3. TEST ITEM DESCRIPTION

Describe any changes or sufficient pertinent information from the approved package that relate to the changes being made by the amendment (i.e. if amendment covers changes in the software then explain what they are). Provide sufficient detail to point out the possible safety concerns associated with the test item design.

4. SYSTEM MATURITY

Describe changes to the system maturity that apply to the amendment. This includes a synopsis of the testing completed to date. This paragraph may include information on what was learned about the system that led to the amendment.

5. PREDICTED/EXPECTED RESULTS

Describe any changes to anticipated results from simulation/analysis generated by the amendment. This should be the project's best prediction of the most credible outcome of the test. Special emphasis should be on documenting any expected results that affect the safe conduct of the test. If there are no predictions available, state the following: "No predictive performance is available from analysis or simulation." This statement should be followed with the project's expected results based on their experience and knowledge of the test program.

6. TYPES OF TESTS (TRAINING)

Identify any changes to the maneuvers to be accomplished during the test or training program and the envelope the aircraft will operate in. Also include any unique test techniques if applicable. Provide sufficient detail for the reader to understand potential safety concerns (lowest altitude, highest airspeed, number of aircraft, steepest dive angle, types of weapons, etc.) without having to reference the test point matrices in the test plan. This paragraph answers the "How" about the test.

7. DIFFERENCES FROM PREVIOUS TESTS

Describe differences from previous or similar programs. Highlight the similarities to previous tests if there are no differences. If deviation from the current flight manual is required as part of the test, summarize the deviation(s) and provide justification.

8. SCOPE

Describe changes to the schedule, program duration, and number of sorties. This answers the "When" about the test.

SECTION V: SAFETY REVIEW SUMMARY

1. REVIEW SYNOPSIS

Technical Review: A summary of the technical review.
Safety Review: A summary of the safety review. The SRB minutes go here.

2. REFERENCES

List those resource documents/lessons learned you reviewed in preparation of the amendment (particularly AFMCP 91-1). This is not a repeat of the references listed in the initial package unless you actually went back and referred to them to write the amendment.

a. AFFTCI 91-5

b. Reference 3

3. MISHAP RESPONSIBILITIES

Identify mishap responsibilities (mishap investigating/reporting responsibilities and accident accountability) for each article, system, personnel, or facility to be involved with this program. This may require references to Memorandums of Agreement, which may need to be included in the supporting documentation. When this information is not clearly spelled out in AFI 91-204, the customer may be required to develop a written mishap plan to be coordinated with AFFTC Flight Safety (AFFTC/SEF) and included in the safety review package before beginning any test activity. This paragraph is typically "No change" unless the amendment is written to document a change in RTO or ownership of the system under test.

4. GENERAL MINIMIZING CONSIDERATIONS

Describe new or changed general minimizing procedures and considerations to be adhered to during the duration of the program that do not apply to a specific hazard already given in a THA. Some minimizing procedures and remarks from the THA may be repeated here for extra emphasis. Each THA and GMC should stand alone in the amendment. If the number of amendments or individual changes becomes high enough that it is inconvenient to brief the required items prior to flight, the amendment may contain all GMCs, with the changes highlighted for the reviewers.

a. First GMC.

b. Second GMC.

5. TEST HAZARD ANALYSES

List the new or changed THAs by title.

a. Title of First THA: Hazard category/Probability

b. Title of Second THA: Hazard category/Probability

6. QUALIFICATION AND TRAINING

Describe the additional qualifications and training team members must have based upon the program change. If no additional qualifications or training are required write "No additional qualifications and/or training are required."

7. TEST ARTICLE RESTRICTIONS

Changes in unique test safety related restrictions (other than those already identified in the general minimizing considerations above) that limit the program in some fashion.

8. SPECIAL CONSIDERATIONS

Describe new items given special consideration (such as test sortie length, sortie complexity, or the addition of a special piece of equipment). Generally, any notable information that does not fit in any of the other paragraphs can be included here.

9. ACTION ITEMS

List any new action items identified during the safety review, along with the corresponding responses. Action items need to be resolved prior to initiating final coordination. The format should state the action item followed by the response, ending with CLOSED or OPEN.

a. Action item text. (Action assigned to)
Action item closure. CLOSED/OPEN

b. Action item text. (Action assigned to)
Action item closure. CLOSED/OPEN

10. RISK ASSESSMENT

AFFTC/SET will identify the proposed risk for the testing covered by the amendment and the reasoning behind why the risk level was assigned. An overall risk can be assigned or various risk levels can be assigned to particular test points or phases. The highest risk level assigned to any part of the test is what goes on the cover of the AFFTC Form 5028 and determines the approval authority. See AFFTCI 91-5 paragraph 7.1.4.

11. COORDINATION COMMENTS

Leave blank and provide enough space, for multiple comments. Attach a blank piece of paper if less than half of the page is available for comments.

Attachment 4

INSTRUCTIONS FOR USE OF AFFTC FORM 5028—SHORT AMENDMENT

A4.1. Use. Minimize unnecessary repetition of information unchanged from the approved package.

A4.2. Preparation

A4.2.1. The test team fills out Sections I through III of the AFFTC Form 5028, except the risk level block. Address changes from the approved safety package. Paragraphs that have not changed should state "No change."

A4.2.2. The test team is responsible for the completion of Section IV with the exception of the Review Synopsis.

A4.2.3. An example is provided in the following pages.

A4.3. UTSO Check. After the test team has completed a rough draft of the AFFTC Form 5028, an UTSO should review the form. This will ensure the test team gets the benefits of the latest safety guidelines and completes the form IAW AFFTCI 91-5. The UTSO will not sign the AFFTC Form 5028 until the UTSO is comfortable that the safety planning accomplished by the test team is sufficient and that the completed form meets AFFTCI 91-5 guidelines.

TEST PROJECT SAFETY REVIEW (INITIAL OR AMENDMENT)
(Refer to AFFTCI 91-5 for complete instructions)

I. PROJECT INFORMATION

INITIAL PROJECT TEST TITLE	OVERALL RISK LEVEL	CONTROL NUMBER	TEST AGENCY
F-37 Super Squirrel Missile Integration	MEDIUM	2005034	416 FLTS

SUBJECT OF AMENDMENT ☐OVERALL RISK CHANGE ☐LONG AMENDMENT ☒SHORT AMENDMENT	AMENDMENT RISK LEVEL	CHANGE NUMBER	PROJECT JON
Unexpected Result - Missile Plume Effects On Aircraft Structure	MEDIUM	2	111SSM00

PROJECT MANAGER (Typed Name and Grade)	SIGNATURE	EMAIL ADDRESS	PHONE NUMBER	DATE
Phillip P. Smith, NH-III		phil.smith@edwards.af.mil	73217	
UNIT TSO (Typed Name and Grade)	SIGNATURE	EMAIL ADDRESS	PHONE NUMBER	DATE
Roger L. Jones, Capt		roger.jones@edwards.af.mil	75297	

II. SAFETY REVIEW MEMBERS

NAME, GRADE	TITLE	SIGNATURE	DATE	COORD COMMENT? YES	NO
Craig B. Tiller, Maj	Operations, 411 FLTS				
Orren R. Manor, NH-III	Flight Dynamics, 412 TW/ENF				

III. COORDINATION AND APPROVAL

POSITION TITLE	SIGNATURE	DATE	ACTION (COORD, APPROVE, INFO, OR N/A)	COORD COMMENT? YES	NO	APPROVAL BRIEF YES	NO
TEST SAFETY OFFICER AFFTC/SET			Coord				
CHIEF OF SAFETY AFFTC/SE			Coord				
SQUADRON COMMANDER (OR EQUIVALENT) 416 FLTS/CC			Coord				
TW TECHNICAL ADVISOR (OR EQUIVALENT) 412 TW/CA			Coord				
GROUP COMMANDER (OR EQUIVALENT) N/A							
GROUP COMMANDER (OR EQUIVALENT) 412 OG/CC			Approve				
TEST WING COMMANDER (OR EQUIVALENT) 412 TW/CC			Info				
AFFTC COMMANDER (OR AS DELEGATED) AFFTC/CC			Info				

RETURN TO AFFTC/SET PRIOR TO FILING AT THE ORIGINATING UNIT

AFFTC FORM 5028 Sep 2001 (EF) Replaces Forms 5028, Dec 96, which will not be used

Figure A4-1 Short Amendment 5028 Example

DD Mmm YYYY Initial Package [Insert Package Number Here] 5028 Remarks 1/1

SECTION IV: SHORT AMENDMENT REMARKS

1. BACKGROUND:

Describe the reason for the amendment. Do not just repeat the words in the initial AFFTC Form 5028. Include enough information from the initial background paragraph to lay the foundation for the amendment. This paragraph answers the "Who, What, Where, and Why" questions about the changes being made to the approved package.

2. CHANGES TO TEST PLAN:

Describe what is being changed about the test plan, and/or test approach.

a. First change.

b. Second change.

3. CHANGES TO SAFETY PLANNING:

Describe what changes are being made to the existing safety planning. Reference specific paragraphs and THAs contained in the approved safety package using an errata type format, i.e. Change GMC in Section V, Paragraph 4.a. to read "..." Each THA and GMC should "stand-alone" in the amendment. If the number of amendments or individual changes becomes high enough that it is inconvenient to brief the required items prior to flight, the amendment may contain all GMCs, with the changes highlighted for the reviewers.

a. First change.

b. Second change.

4. REVIEW SYNOPSIS:

Include a synopsis of the technical review, if applicable. AFFTC/SET will provide a summary of the safety planning conducted in support of this change. As a minimum, this paragraph will contain a statement to the effect of "AFFTC/SET has reviewed this change and determined it does not constitute a change in risk level or major test plan revision and therefore can be documented via a Short Amendment IAW AFFTCI 91-5."

5. COORDINATION COMMENTS:

Leave blank and provide enough space, for multiple comments. Attach a blank piece of paper if less than half of the page is available for comments.

Attachment 5

INSTRUCTIONS FOR MEMORANDUM AMENDMENT

A5.1. Use. The memorandum amendment is used to document a minor test plan change that does not affect safety planning. Since the Squadron Commander (or equivalent) approves this change, it is critical that the test team and AFFTC/SET, serving as the only source of independent review, agree that a memorandum is appropriate.

A5.2. Preparation.

A5.2.1. The test team completes the memorandum. A clear case must be made that the change to the test plan is minor and does not affect the safety planning. The in-turn memorandum format is used.

A5.2.2. The memorandum will be assigned the next available change number and placed in the safety package IAW all other amendment requirements.

A5.2.3. The AFFTC/SET reviewer will write “concur” or “nonconcur” then initial and date the memorandum next to the “IN TURN” address. AFFTC/SET concurrence is required prior to approval.

A5.2.4. An example is provided on the following page.

A5.3. UTSO Check. After the test team has completed a rough draft of the memorandum, an UTSO should review the form. This will ensure the test team gets the benefits of the latest safety guidelines and completes the form IAW AFFTCI 91-5.

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE FLIGHT TEST CENTER (AFMC)
EDWARDS AIR FORCE BASE, CALIFORNIA

22 December 2005

MEMORANDUM FOR AFFTC/SET
445 FLTS/CC
445 FLTS/DOA
IN TURN

FROM: 445 FLTS/DOA

SUBJECT: Addition of Test Points for Instrumentation Check-Out (Amendment 3 to Safety Package 2005150)

1. Background: During ground testing, an anomaly was discovered in the instrumentation system that may result in data loss at speeds greater than 0.7 IMN. The parameters in doubt are not safety of flight or safety of test parameters, but are necessary for a successful test.

2. Summary of Change: Two test points will be added to investigate this potential problem. The current build-up plan for IMN progresses directly to 0.8 IMN from 0.7 IMN. The test technique will be accomplished at 0.73 IMN and 0.76 IMN to investigate the anomaly.

3. Coordination: Mr. Cal Squint of Special Instrumentation and Mr. Stephen Canyon of AFFTC/SET reviewed the proposed change.

4. POC: Terry Heiraute, x51212, terry.heiraute@edwards.af.mil.

TERRY HEIRAUTE, NH-III
Have Expansion Program Manager

1st Ind, 445 FLTS/CC

MEMORANDUM FOR 445 FLTS/DOA

The subject amendment is approved/disapproved.

JONATHAN BOSS, Lt Col, USAF
Commander, 445 FLTS

Figure A5-1 Memorandum Change Example

Attachment 6

INSTRUCTIONS FOR USE OF AFFTC FORM 5028—CONTINUATION AMENDMENT

A6.1. Use.

A6.1.1. The Continuation Amendment is used to document lessons learned and affirm that all safety planning remains sufficient and valid for testing

A6.1.2. A continuation amendment will be required to continue testing past each yearly anniversary of the initial safety package approval date.

A6.2. Preparation.

A6.2.1. The test team fills out Sections I through IV of the AFFTC Form 5028.

A6.2.2. An example is contained in the following pages.

A6.3. UTSO Check. After the test team has completed a rough draft of the AFFTC Form 5028, an UTSO should review the form. This will ensure the test team gets the benefits of the latest safety guidelines and completes the form IAW AFFTCI 91-5. The UTSO will not sign the AFFTC Form 5028 until the UTSO is comfortable that the completed form meets AFFTCI 91-5 guidelines.

TEST PROJECT SAFETY REVIEW (INITIAL OR AMENDMENT)
(Refer to AFFTCI 91-5 for complete instructions)

I. PROJECT INFORMATION

INITIAL PROJECT TEST TITLE	OVERALL RISK LEVEL	CONTROL NUMBER	TEST AGENCY
F-37 Super Squirrel Missile Integration	MEDIUM	2005034	416 FLTS
SUBJECT OF AMENDMENT ☐OVERALL RISK CHANGE ☐LONG AMENDMENT ☐SHORT AMENDMENT	AMENDMENT RISK LEVEL	CHANGE NUMBER	PROJECT JON
Continuation	N/A	3	111SSM00

PROJECT MANAGER (Typed Name and Grade)	SIGNATURE	EMAIL ADDRESS	PHONE NUMBER	DATE
Phillip P. Smith, NH-III		phil.smith@edwards.af.mil	73217	
UNIT TSO (Typed Name and Grade)	SIGNATURE	EMAIL ADDRESS	PHONE NUMBER	DATE
Roger L. Jones, Capt		roger.jones@edwards.af.mil	75297	

II. SAFETY REVIEW MEMBERS

NAME, GRADE	TITLE	SIGNATURE	DATE	COORD COMMENT? YES	NO

III. COORDINATION AND APPROVAL

POSITION TITLE	SIGNATURE	DATE	ACTION (COORD, APPROVE, INFO, OR N/A)	COORD COMMENT? YES	NO	APPROVAL BRIEF YES	NO
TEST SAFETY OFFICER AFFTC/SET			Approve				
CHIEF OF SAFETY AFFTC/SE			Info				
SQUADRON COMMANDER (OR EQUIVALENT) 416 FLTS/CC			Info				
TW TECHNICAL ADVISOR (OR EQUIVALENT) 412 TW/CA			Info				
GROUP COMMANDER (OR EQUIVALENT) N/A							
GROUP COMMANDER (OR EQUIVALENT) 412 OG/CC			Info				
TEST WING COMMANDER (OR EQUIVALENT) 412 TW/CC			Info				
AFFTC COMMANDER (OR AS DELEGATED) AFFTC/CC			Info				

RETURN TO AFFTC/SET PRIOR TO FILING AT THE ORIGINATING UNIT

AFFTC FORM 5028 Sep 2001 (EF) Replaces Forms 5028, Dec 96, which will not be used

Figure A6-1 Continuation Amendment 5028 Example

DD Mmm YYYY Initial Package [Insert Package Number Here] 5028 Remarks 1/1

SECTION IV: CONTINUATION AMENDMENT REMARKS

1. PURPOSE:

The purpose of this amendment is to document lessons learned and justify continued testing under the subject AFFTC Form 5028.

2. LESSONS LEARNED:

Describe lessons learned that have not been adequately documented in a previous amendment. Include enough information to make the lessons learned "stand-alone." It is recommended that the lessons that were submitted to the AFFTC database be duplicated here if they have anything to do with safety planning. Mention if the lesson resulted in a change to the safety planning.

a. First lesson.

b. Second lesson.

3. SUBMISSIONS TO AFFTC LESSONS LEARNED DATABASE:

If the test team submitted any lessons to the AFFTC database, list them here. This will aid future researchers.

a. First lesson learned title.

b. Second lesson learned title.

Attachment 7

INSTRUCTIONS FOR USE OF AFFTC FORM 5028—CLOSURE AMENDMENT

A7.1. Use. The Closure Amendment is used to document lessons learned and evaluate the adequacy of the safety planning. A well-written closure amendment will "close the loop" on a safety package and help future researchers benefit the most from their predecessors.

A7.2. Preparation

A7.2.1. The test team fills out Sections I through IV of the AFFTC Form 5028.

A7.2.2. An example is contained in the following pages.

A7.3. UTSO Check. After the test team has completed a rough draft of the AFFTC Form 5028, an UTSO should review the form. This will ensure the test team gets the benefits of the latest safety guidelines and completes the form IAW AFFTCI 91-5. The UTSO will not sign the AFFTC Form 5028 until the UTSO is comfortable that the completed form meets AFFTCI 91-5 guidelines.

TEST PROJECT SAFETY REVIEW (INITIAL OR AMENDMENT)
(Refer to AFFTCI 91-5 for complete instructions)

I. PROJECT INFORMATION

INITIAL PROJECT TEST TITLE	OVERALL RISK LEVEL	CONTROL NUMBER	TEST AGENCY
F-37 Super Squirrel Missile Integration	MEDIUM	2005034	416 FLTS

SUBJECT OF AMENDMENT ☐OVERALL RISK CHANGE ☐LONG AMENDMENT ☐SHORT AMENDMENT	AMENDMENT RISK LEVEL	CHANGE NUMBER	PROJECT JON
Closure	N/A	4	111SSM00

PROJECT MANAGER (Typed Name and Grade)	SIGNATURE	EMAIL ADDRESS	PHONE NUMBER	DATE
Phillip P. Smith, NH-III		phil.smith@edwards.af.mil	73217	
UNIT TSO (Typed Name and Grade)	SIGNATURE	EMAIL ADDRESS	PHONE NUMBER	DATE
Roger L. Jones, Capt		roger.jones@edwards.af.mil	75297	

II. SAFETY REVIEW MEMBERS

NAME, GRADE	TITLE	SIGNATURE	DATE	COORD COMMENT? YES	NO

III. COORDINATION AND APPROVAL

POSITION TITLE	SIGNATURE	DATE	ACTION (COORD, APPROVE, INFO, OR N/A)	COORD COMMENT? YES	NO	APPROVAL BRIEF YES	NO
TEST SAFETY OFFICER AFFTC/SET			Approve				
CHIEF OF SAFETY AFFTC/SE			Info				
SQUADRON COMMANDER (OR EQUIVALENT) 416 FLTS/CC			Info				
TW TECHNICAL ADVISOR (OR EQUIVALENT) 412 TW/CA			Info				
GROUP COMMANDER (OR EQUIVALENT) N/A							
GROUP COMMANDER (OR EQUIVALENT) 412 OG/CC			Info				
TEST WING COMMANDER (OR EQUIVALENT) 412 TW/CC			Info				
AFFTC COMMANDER (OR AS DELEGATED) AFFTC/CC			Info				

RETURN TO AFFTC/SET PRIOR TO FILING AT THE ORIGINATING UNIT

AFFTC FORM 5028 Sep 2001 (EF) Replaces Forms 5028, Dec 96, which will not be used

Figure A7-1 Closure Amendment 5028 Example

SECTION IV: CLOSURE AMENDMENT REMARKS

1. PURPOSE:

The purpose of this amendment is to close the subject AFFTC Form 5028.

2. LESSONS LEARNED:

Describe lessons learned. Include enough information to make the lessons learned "stand-alone." It is recommended that the lessons that were submitted to the AFFTC database be duplicated here if they have anything to do with safety planning.

a. First lesson.

b. Second lesson.

3. REVIEW OF SAFETY PLANNING AND THAS:

Describe the best and worst GMCs and THAs. If any procedure directly increased the safety of the test in an obvious way, this is a good place to inform future planners of your success. On the other hand, if a procedure caused more headaches than reduced risk, or even decreased safety by being a distraction, then discuss it here.

a. First narrative.

b. Second narrative.

4. SUBMISSIONS TO AFFTC LESSONS LEARNED DATABASE:

If the test team submitted any lessons to this database, it should be listed here. This will lead future researchers to these lessons-learned in the database.

a. First lesson learned title.

b. Second lesson learned title.

Attachment 8

AFFTC RISK ASSESSMENT METHOD

A8.1. THA Risk Assessment.

A8.1.1. **Hazard Probability.** The safety review board members subjectively assess the hazard probability. Minimizing procedures taken into consideration for the assessment. If quantitative probabilities are available from the contractor/SPO Hazard Analyses, the board must consider them.

Table A8-1 Hazard Probability Definitions

HAZARD PROBABILITY	DEFINITION
Frequent	Likely to occur frequently during the test.
Probable	Will occur several times during the test.
Occasional	Likely to occur sometime during the test.
Remote	Unlikely, but possible to occur during the test.
Improbable	Highly unlikely to occur during the test.

A8.1.2. **Hazard Severity Category.** This is a qualitative measure of hazard's effect. Severity is assessed with all minimizing procedures and corrective actions in place. Hazard categories are defined in the following table:

Table A8-2 Hazard Severity Categories

CATEGORY	DESCRIPTION
I	Catastrophic. May cause death, system loss, or severe environmental damage.
II	Critical. May cause severe injury, severe occupational illness, or major system/facility/environmental damage; or requires action to prevent a Category I hazard.
III	Marginal. May cause minor injury, occupational illness, or minor system/facility/environmental damage; or requires action to prevent a Category II hazard.
IV	Negligible. May cause less than minor injury, occupational illness, or system/facility/environmental damage. (We do not normally document Category IV Hazards in the Test Safety Review Process unless the likelihood is very high.)

A8.1.3. **Specific Test Hazard Risk Assessment.**

A8.1.3.1. The SRB will not assign a risk level for each THA, but will keep in mind the region of the risk assessment chart (Figure A8-1) that each THA falls into. The cumulative effect of all THAs is taken into consideration during the overall risk assessment.

A8.1.3.2. The risk category divisions of the risk assessment chart are intentionally drawn through the different arbitrary combinations of severity and probability. This is an acknowledgement of reality, where severity and probability follow a continuum unbound by arbitrary divisions. Board members are thus reminded of the subjective nature of their assessment. These lines should also remind the test team and SRB members that although a minor improvement in the safety plan may not change the assessed "severity," "probability," or "risk," it will still reduce the *actual* risk.

A8.2. Overall Risk Assessment.

A8.2.1. Overall risk level is the degree of risk assumed by AFFTC management in allowing the proposed test to be accomplished in the manner described (including all minimizing procedures and corrective actions) and under the conditions specified. AFFTC overall risk levels are defined in Table A8-3. The safety review board assesses overall risk.

A8.2.2. Overall risk must not be contradicted by the probability/severity categories of the THAs. However, overall risk may (and frequently does) exceed the assessed risks for all THAs. The SRB makes this determination based upon the complexity of the test, the potential for safety-related "unknown unknowns," and their own experience.

A8.2.3. Overall risk is assessed, in part, by estimating the incremental risk above normal operations. "Normal operations" are operations within the cleared envelope of the system that are routinely accomplished by qualified aircrew or operators under approved guidance.

Table A8-3 Overall Risk Level Assessment

ASSESSMENT	DESCRIPTION AND IMPLICATION
LOW RISK	Tests or activities that present no greater risk than normal operations. Routine supervision is appropriate.
MEDIUM RISK	Tests or activities that present a greater risk to personnel, equipment, or property than normal operations and require more than routine supervision.
HIGH RISK	Tests or activities that present a significant risk to personnel, equipment, or property, even after all precaution measures have been taken.

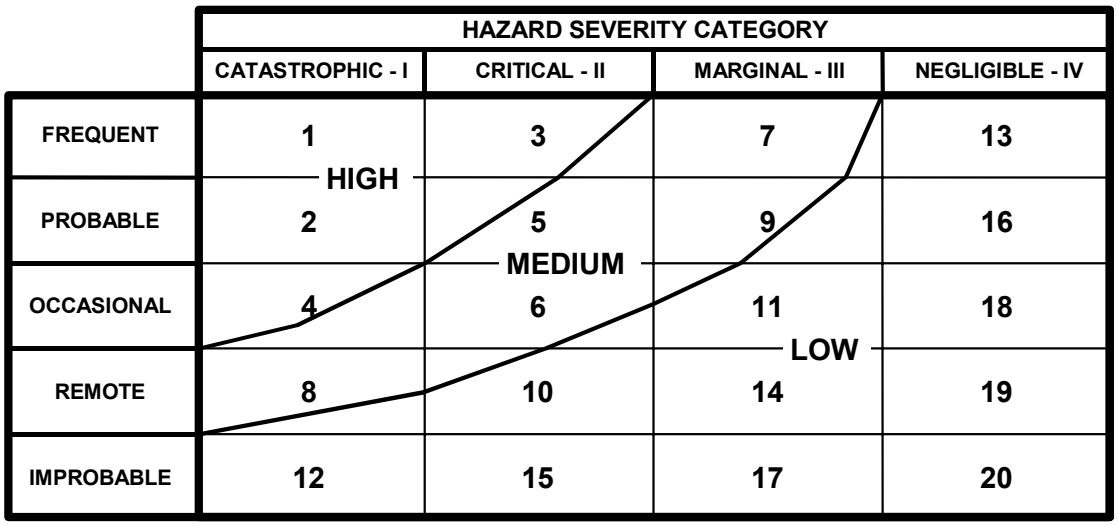

Figure A8-1 Hazard Analysis Risk Assessment Matrix

A8.3. Elevated Risk Test Elements. Certain tests conducted at the AFFTC have demonstrated a higher than normal risk due to the inherent hazards involved. In the absence of predicted levels of performance, use the following list of tests as a guide in identifying those tests which require close analysis to determine if a Risk Level of MEDIUM or HIGH is warranted. If the analysis clearly indicates that the predicted performance (flying qualities, PIO susceptibility, flutter margin, loads margins, etc.) are well within acceptable levels, the test point need not be considered elevated risk even if it is envelope expansion. This may be especially true if the analysis model has been validated through other simulation/flight test activity.

A8.3.1. First flights of new/modified aircraft configurations (including structures, changes to flying qualities, performance armament configurations, and major T-2 modifications).

A8.3.2. New or modified aircraft life support systems.

A8.3.3. Flight envelope expansion.

A8.3.4. Flutter testing.

A8.3.5. Rejected takeoffs or performance landings at high brake energy levels.

A8.3.6. Single-engine aircraft airstart envelope determination.

A8.3.7. High AOA, spin prevention and out-of-control recovery tests.

A8.3.8. Helicopter height-velocity envelope determination.

A8.3.9. Ground and air minimum control speed determination.

A8.3.10. Flight tests of development or prototype unmanned vehicles.

A8.3.10.1. Photo/Safety chase of dynamic or low altitude maneuvering.

A8.3.10.2. Operation over non-withheld land.

A8.3.11. Tests involving high energy devices or hazardous materials.

A8.3.12. Armament testing.

A8.3.12.1. Testing with live explosive warheads.

A8.3.12.2. Powered flight of developmental or prototype missiles.

A8.3.12.3. Flight envelope clearance tests of new armament or release systems.

A8.3.12.4. Photo/Safety chase of any weapon during fly-out or termination.

A8.3.13. Terrain avoidance/terrain following tests.

A8.3.14. Initial man/equipment aerial deliveries.

Attachment 9

HAZARD IDENTIFICATION AND MINIMIZATION CHECKLIST

A9.1. General.

A9.1.1. This attachment is a compilation of items found in the past to be of significance during AFFTC Test Safety planning. For more detailed guidance, consult AFMCP 91-1 and the Safety Center risk management guide, both described below:

A9.1.2. AFMCP 91-1, *Flight Safety and Technical Considerations Guide for Flight Testing* provides planning guide questions that should be addressed for certain types of testing. All programs will review AFMCP 91-1 and annotate the review in the "References" section of the AFFTC Form 5028.

A9.1.3. An additional document to aid in the identification of potential hazards is a Risk Management Guide for Air Force Operation, 6 Nov 79, prepared by the Directorate of Aerospace Safety, AFISC, Norton AFB. This guide presents potential hazards of several common elements of a test program ranging from the test vehicle itself to personnel, facilities, environment, and procedures. By applying a checklist to each element, the guide develops a preliminary hazard list. More current guidance on operational risk management can be found in AFI 91-213, *Operational Risk Management Program*, and AFPAM 91-215, *Operational Risk Management Guidelines and Tools*.

A9.1.4. While preparing the AFFTC Forms 5028 for the safety review, the test team should complete the items listed in 9.2 through 9.12 for test programs, and items 9.13 through 9.16 for non-test activities.

A9.2. Validate Requirement for the Test.

A9.2.1. How does the test meet the user's needs?

A9.2.2. Is the test necessary (especially if it is high risk in nature)?

A9.2.3. Who requested the test?

A9.2.4. What documents this request (PD, PID)?

A9.2.5. Risk/benefit assessment of test?

A9.3. Determine Mishap Responsibility/Accountability.

A9.3.1. Has AFI 91-204 been referenced?

A9.3.2. Who possesses the aircraft or vehicle used?

A9.3.3. Who has accident accountability?

A9.3.4. Whose aircrews will perform the tests?

A9.3.5. Who is the individual/organization responsible for ensuring the safe conduct of this test?

A9.3.6. Who is responsible for mishap investigation and reporting?

A9.3.7. What is the plan of action if a mishap occurs? (Include test crew, chase, test conductor).

A9.3.8. What are crash and rescue requirements?

A9.4. Research Lessons Learned.

A9.4.1. Review results from similar past tests:

A9.4.1.1. Test reports, AFFTC or other.

A9.4.1.2. Deficiency and service reports.

A9.4.1.3. Previous AFFTC Forms 5028.

A9.4.1.4. Mishap summaries from AFSC/SEPR.

A9.4.1.5. Review AFFTC Lessons Learned.

A9.4.1.6. Review contractor Hazard Analyses.

A9.4.2. Question personnel with past experience.

A9.5. Complete Technical Review.

A9.5.1. Technical review accomplished.

A9.5.2. Define technical requirements adequately so that test procedures and hazards may be determined.

A9.5.3. Define test conditions sufficiently to enable safety review members to make a risk assessment.

A9.6. Documentation Preparation Testing.

A9.6.1. What tests or simulations have been or will be conducted and by whom?

A9.6.2. What are the results and who reviews?

A9.6.3. How are the results documented and approved?

A9.6.4. When will they be completed?

A9.6.5. Typical tests for mechanical systems.

A9.6.5.1. Lab tests.

A9.6.5.2. Computer simulation.

A9.6.5.3. Electromagnetic interference tests.

A9.6.5.4. Form, fit, and function tests.

A9.6.5.5. Qualification tests.

A9.6.5.6. Wind tunnel.

A9.6.5.7. Static tests.

A9.6.5.8. Ground tests.

A9.6.5.9. System maturity.

A9.6.6. Typical tests for Computer Hardware.

A9.6.6.1. Previous tests (on new equipment or old equipment in other systems).

A9.6.6.2. Software integration laboratory/emulator/simulator.

A9.6.7. Computer hardware questions to ask:

A9.6.7.1. Were bench test wire lengths identical to aircraft wire lengths?

A9.6.7.2. Was the bench test component configuration identical to the aircraft?

A9.6.7.3. Was the bench test a full up test or a reduced scale test (were all systems active and were all multi- and parallel processors working)?

A9.6.7.4. Are qualification tests complete?

A9.6.7.5. How much of the system is new and how much has been used in other systems?

A9.6.7.6. What is the purpose of this computer system (avionics, flight control, weapons, propulsion, interface, etc.)?

A9.6.7.7. What type of redundancy does the system have in voting logic and in hardware?

A9.6.7.8. Are the redundant systems identical hardware or unique?

A9.6.7.9. If there is a backup system? Is it analog, digital, or mechanical?

A9.6.8. Considerations for computer software.

A9.6.8.1. What stage of maturity is the software?

A9.6.8.2. What is the level of support?

A9.6.8.3. What is the status of the built-in-test?

A9.6.8.4. What is the software checkout process (coding, SIL, hardware-in-the-loop, iron bird if flight control software, etc.)?

A9.6.8.5. Is the software fail-safe, fail-operate, or default?

A9.6.8.6. What type of redundancy does the software have (i.e. same coding from system to system or channel to channel), and what are the voting rules?

A9.6.8.7. How is the code verified and who does it (independent or in-house)?

A9.6.8.8. Does the software have a backup system? If so, what type (analog, digital, or mechanical)?

A9.6.8.9. What happens if there is a power interruption?

A9.6.8.10. What types of ground tests were performed (on aircraft, IFAST, etc.)?

A9.6.8.11. What is the software review process from identification of problems to testing the solution?

A9.6.8.12. What type of configuration control process is used?

A9.6.8.13. What are the results of the ground tests (does the system meet MIL STDs)?

A9.7. Define Project Manager Administration.

A9.7.1. Who prepared and reviewed the THAs?

A9.7.2. What contractor system safety analysis was or will be done?

A9.7.3. What criteria will be used to reconvene the SRB?

A9.8. Review Test Accomplishment.

A9.8.1. Is the test being done in the safest manner?

A9.8.1.1. Can test objectives be accomplished with less risk involved?

A9.8.1.2. Can high risk portions of the test be deleted or modified without degradation of result?

A9.8.1.3. What are the critical areas?

A9.8.1.4. Will aircraft systems and components be tested in non-critical areas before being relied upon in critical areas?

A9.8.1.5. What is the buildup technique?

A9.8.1.6. Are crewmembers kept to a minimum consistent with risk?

A9.8.1.7. Do test procedures degrade pilot performance during critical maneuvers?

A9.8.1.8. Does the test aircraft require increased inspection due to the nature of the test (high loads, high Q, etc.)?

A9.8.2. Is the existing flight envelope being exceeded (airspeed, G-load, center of gravity, gross weight, etc.)?

A9.8.3. If a published limit will be exceeded (or new envelope added), who authorized it? By what document?

A9.8.4. Are regression tests identified for hardware/software updates?

A9.9. Review Test Control.

A9.9.1. Have control room personnel had adequate training for the test?

A9.9.2. Are safety go/no go and abort criteria established?

A9.9.2.1. Instrumentation parameters?

A9.9.2.2. System failures?

A9.9.2.3. Weather (day and night)?

A9.9.3. Will point-by-point clearance be issued in flight? What will it be based on (MIL-STD, simulator results)?

A9.9.4. Who is the go/no go decision-maker? What analysis is required to support this decision?

A9.9.5. What communications will be used? Are these adequate?

A9.9.6. What deviations are authorized to the test plan? Who approves them?

A9.9.7. What are specific chase duties and qualifications?

A9.9.8. Have flights been planned to minimize, if practical, operations in congested airspace?

A9.9.9. To minimize midair collision potential, has test planning included use of all available facilities (SPORT/RAPCON/DARC Radar Tracking, chase, etc.)?

A9.9.10. For those tests that require multiple ranges, who has Lead Range, Participating Range? What are the authorities and responsibilities of each?

A9.10. Review Procedures.

A9.10.1. Have TO checklists or procedures been written for:

A9.10.1.1. Mission Control Center?

A9.10.1.2. Loading procedures?

A9.10.1.3. Maintenance procedures?

A9.10.1.4. Aircrew procedures?

A9.10.1.5. Emergencies?

A9.10.1.6. Off-site unique operating procedures?

A9.10.2. Who approved these procedures?

A9.10.3. How are these procedures updated and approved during the test?

A9.10.4. Have all munitions loading checklists been validated IAW AFFTCR 136-3?

A9.11. T-2 Modification Considerations.

A9.11.1. What is the status of T-2 Modifications?

A9.11.2. Has Air Force Seek Eagle Office or the SPO approved all uncertified stores for carriage and release?

A9.11.3. What modifications to the cockpit controls have been accomplished?

A9.11.4. Is there a single switch to deactivate a modified system? Where is it?

A9.11.5. Have T-2 modification hazards (preliminary Hazard Analysis) been addressed on the AFFTC Form 5028A (Test Hazard Analysis)?

A9.11.6. Are any special inspections needed before, during, or after the test?

A9.11.7. Who is responsible for installing and maintaining the equipment?

A9.11.8. Is the modification really practical for an operational environment (fail safe, satisfactory for night, icing, etc.)?

A9.11.9. Have T-2 Modifications and associated modification flight manuals been signed?

A9.12. Consider Test Unique Requirements.

A9.12.1. Is any special training needed?

A9.12.1.1. Academic?

A9.12.1.2. Procedural simulator?

A9.12.1.3. Profile practice in similar aircraft?

A9.12.1.4. Egress training?

A9.12.1.5. High angle of attack/spin training?

A9.12.2. Any special qualification criteria (total flight hours, total flight hours in type aircraft, flight hours in last 90 days, etc.)?

A9.12.3. Is any unusual individual equipment needed? For example:

A9.12.3.1. Cold weather.

A9.12.3.2. Over water.

A9.12.3.3. Survival gear.

A9.12.3.4. Fire fighting equipment.

A9.12.4. Are any special inspections needed on the aircraft before, during, or after the test?

A9.12.5. Is any nonstandard support equipment needed?

A9.12.6. What emergency equipment is available at off-base test sites?

A9.12.7. Are hazardous materials involved in the program?

A9.12.8. Has safe eye exposure distance been established for laser equipment?

A9.12.9. What flight restrictions have been placed on the project? Are there restrictions/special procedures that have been/will be added to the aircraft information sheet?

A9.12.10. What are the aircraft and test go/no-go items (parameters, support equipment, personnel, weather, etc.)? Have aircraft discrepancy review procedures been established to avoid potential adverse impact on evaluation flights? Are these discrepancies a part of the preflight brief to ensure that no potential exists for interface with scheduled test maneuvers?

A9.12.11. In order to ensure that no undue hazard to ground personnel or possible damage to equipment exists, what changes or special precautions to normal aircraft maintenance or ground handling procedures are required? Is crew change with engines running required? If so, what are the procedures?

A9.13. Air shows.

A9.13.1. Are all profiles and pilot techniques in accordance to the flight manual and Air Force directives?

A9.13.2. Have profiles been approved in accordance with AFI 11-209, and any supplements? Is this still a current reference?

A9.13.3. What are the weather minimums including winds, temperature, and visibility?

A9.13.4. What communications are to be used? Are these adequate? What backup is available?

A9.13.5. Is the disaster response team located free of crowds?

A9.13.6. How is the air show supervised? Who is the mission commander? Does the mission commander have positive control over all activities?

A9.13.7. Are aircrews the best qualified?

A9.13.8. What are the minimum altitude, maximum speed, maximum G, minimum fuel and minimum distance from the crowd?

A9.13.9. What would be the consequences of any failure state during the profile; for example, engine failure, etc.?

A9.13.10. Have all the requirements of AFI 11-209, *Air Force Participation in Aerial Events*, and supplements thereto been met?

A9.13.11. Is there a "low show" weather profile and has it been approved/practiced?

A9.14. Open House.

A9.14.1. Have the lessons learned from past air shows been reviewed?

A9.14.2. Has the weather been considered? What do you do if there are high winds, high temperature, or low temperature?

A9.14.3. Where is the medical first aid station located? How is it staffed and equipped? Is it marked adequately?

A9.14.4. How is the crowd controlled, to include traffic and parking, barriers from hazardous areas or aircraft?

A9.14.5. Are the facilities adequate and safe? Who inspects the review stands, PA system, latrines, concession booths, no smoking signs, and refuse collection?

A9.14.6. How are personnel prohibited from standing on roofs of buildings?

A9.14.7. Have positive traffic control measures been taken to keep vehicles from driving through the crowd?

A9.15. Static Displays.

A9.15.1. Do you have procedures to make transient aircraft safe for public viewing?

A9.15.2. Are all aircraft de-armed, including ejection seat for open cockpit aircraft and canopy jettison systems?

A9.15.3. Are open cockpit aircraft supervised by a qualified crewmember? How long is each crewmember's tour of duty?

A9.15.4. Do satisfactory barriers exist to prevent people from standing under or around fueled aircraft?

A9.15.5. Have all the requirements of AFI 11-209 and its supplements been met?

A9.16. Antique Fly-In.

A9.16.1. Has liability for all aircraft been addressed per AFPD 10-10, *Civilian Aircraft Use of United States Air Force Airfields*, and/or AFPD 10-18, *Foreign Governmental Aircraft Use of United States Air Force Airfields*?

A9.16.2. What are the procedures for handling non radio-equipped aircraft?

A9.16.3. Are these aircraft secured in case of high winds?

A9.16.4. If high winds occur, where will these aircraft land and take off? What method exists for notifying airborne, non radio-equipped aircraft of the high crosswind, active runway condition?

A9.16.5. Is the ground crew qualified to handle these aircraft? Are they alerted to the hazards of propellers or fragile constructions?

A9.16.6. Has adequate crowd control been developed?